

**TABLE OF CONTENTS**  
**SECTION 7**  
**DESCRIPTION AND OPERATION**  
**OF THE AIRPLANE AND ITS SYSTEMS**

Paragraph No.		Page No.
7.1	The Airplane . . . . .	7-1
7.3	Airframe . . . . .	7-1
7.5	Engine and Propeller . . . . .	7-2
7.7	Induction System . . . . .	7-2
7.9	Engine Controls . . . . .	7-3
7.11	Landing Gear . . . . .	7-4b
7.13	Flight Controls . . . . .	7-6
7.15	Fuel System . . . . .	7-9
7.17	Electrical System . . . . .	7-10b
7.19	Vacuum System . . . . .	7-14
7.21	Instrument Panel . . . . .	7-14
7.23	Pitot-Static System . . . . .	7-17
7.25	Heating and Ventilating System . . . . .	7-19
7.27	Cabin Features . . . . .	7-19
7.29	Baggage Area . . . . .	7-20a
7.31	Stall Warning . . . . .	7-20a
7.33	Finish . . . . .	7-20a
7.35	Air Conditioning . . . . .	7-20b
7.37	Piper External Power . . . . .	7-22
7.39	Emergency Locator Transmitter . . . . .	7-22
7.41	Radar . . . . .	7-24

SECTION 7

DESCRIPTION AND OPERATION  
OF THE AIRPLANE AND ITS SYSTEMS

7.1 THE AIRPLANE

The PA-32-300 is a six-place (seventh seat optional), single-engine, low-wing, all metal monoplane.

7.3 AIRFRAME

Except for the tubular steel engine mount, steel landing gear struts, other miscellaneous steel parts, and the fiberglass or ABS plastic extremities - cowling and tips of wing and tail surfaces - the basic airframe is of aluminum alloy.

The fuselage is a conventional semi-monocoque structure with a cabin door on the right front and a cargo and passenger door on the left rear.

The wings are attached to each side of the fuselage by the insertion of the butt ends of the main spars into a spar box carry-through which is an integral part of the fuselage structure. This provides, in effect, a continuous main spar with splices at each side of the fuselage. There are also fore and aft attachments at the rear spar and at an auxiliary front spar.

The wing airfoil section is a laminar flow type, NACA65<sub>2</sub>-415 with a maximum thickness at about 40% aft of the leading edge.

The empennage consists of the fin, the stabilator, and the stabilator trim tab.



## 7.5 ENGINE AND PROPELLER

The Lycoming IO-540-K1G5 engine installed in the PA-32-300 is rated at 300 horsepower at 2700 rpm. This engine has a compression ratio of 8.7 to 1 and requires 100/130 minimum octane fuel. The engine is equipped with a geared starter, a 60 ampere alternator, dual magnetos, vacuum pump drive, and fuel injection.

The exhaust pipes are routed in pairs to three heavy gauge stainless steel mufflers. Exhaust gases are routed overboard at the underside of the engine cowling. The mufflers are surrounded by a shroud which provides heat for the cabin and for windshield defrosting.

Cowling on the Cherokee Six is designed to cool the engine in all normal flight conditions, including protracted climb, without the use of cowl flaps or cooling flanges.

The constant speed propeller is a Hartzell HC-C2YK-1( )F/F8475D-4 with a diameter of 80 inches. The propeller is controlled by a governor mounted at the left forward side of the crankcase. The governor is operated by a cable from the power control quadrant.

## 7.7 INDUCTION SYSTEM

An induction scoop is located on the left side of the lower cowl. An intake air box is attached to the inside of the cowl adjacent to the air filter box. The filter box is located at the aft end of the induction scoop. Access to the filter is gained through a detachable plate located on the outside of the lower cowl. The intake air box incorporates a manually operated two-way valve designed to allow induction air either to pass through the filter or to bypass the filter and supply heated air directly to the engine.

Alternate air selection insures induction air flow should the filter become blocked. Since the air is heated, the alternate air system offers protection against induction system blockage caused by snow or freezing rain, or by the freezing of moisture accumulated in the induction air filter. Alternate air is unfiltered; therefore, it should not be used during ground operation when dust or other contaminants might enter the system. The primary (through the filter) induction source should always be used for takeoffs. The control is operated by pressing the knob to the left to clear the retaining gate and then moved in the desired direction.

The Bendix RSA-10ED1 type fuel injection system consists of a servo regulator which meters fuel flow in proportion to air flow to the engine, giving the proper fuel-air mixture at all engine speeds, and a fuel flow divider which receives the metered fuel and accurately divides the fuel flow among the individual cylinder fuel nozzles.

A combination fuel flow indicator and manifold pressure gauge is installed in the left side of the instrument panel. The fuel flow indicator is connected to the fuel flow divider and monitors fuel pressure. The instrument converts fuel pressure to an accurate indication of fuel flow in gallons per hour and percentage of cruise power.



## 7.9 ENGINE CONTROLS

Engine controls consist of a throttle control, a propeller control and a mixture control lever. These controls are located on the control quadrant on the lower center of the instrument panel (Figure 7-1) 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 the manifold pressure. The propeller control lever is used to adjust the propeller speed from high RPM to low 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 control lever in the full lean position. In addition, the mixture control has a lock to prevent activation of the mixture control instead of the pitch control. For information on the leaning procedure, see the Avco-Lycoming Operator's Manual.

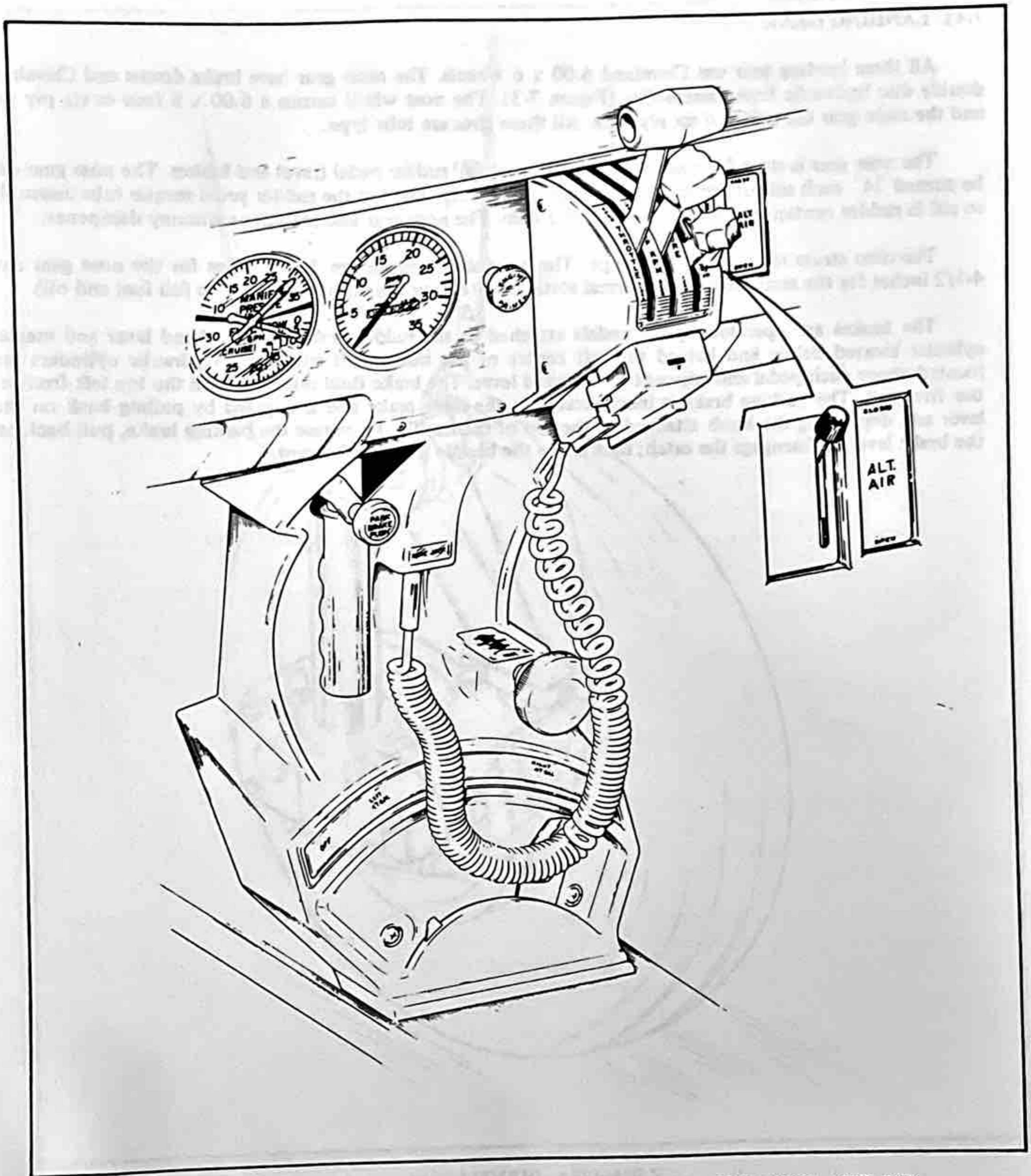
The friction adjustment lever on the right side of the control quadrant may be adjusted to increase or decrease the friction holding the throttle, propeller, and mixture controls or to lock the controls in a selected position.

The alternate air control is located to the right of the control quadrant. When the alternate air lever is in the up, or closed, position the engine is operating on filtered air; when the lever is in the down, or open, position the engine is operating on unfiltered, heated air. The control is operated by pressing the knob to the left to clear the retaining gate and then moved in the desired direction. (Refer to Figure 7-1.)









CONTROL QUADRANT AND CONSOLE (SERIAL NOS. 32-7940001 AND UP)

Figure 7-1a



## 7.11 LANDING GEAR

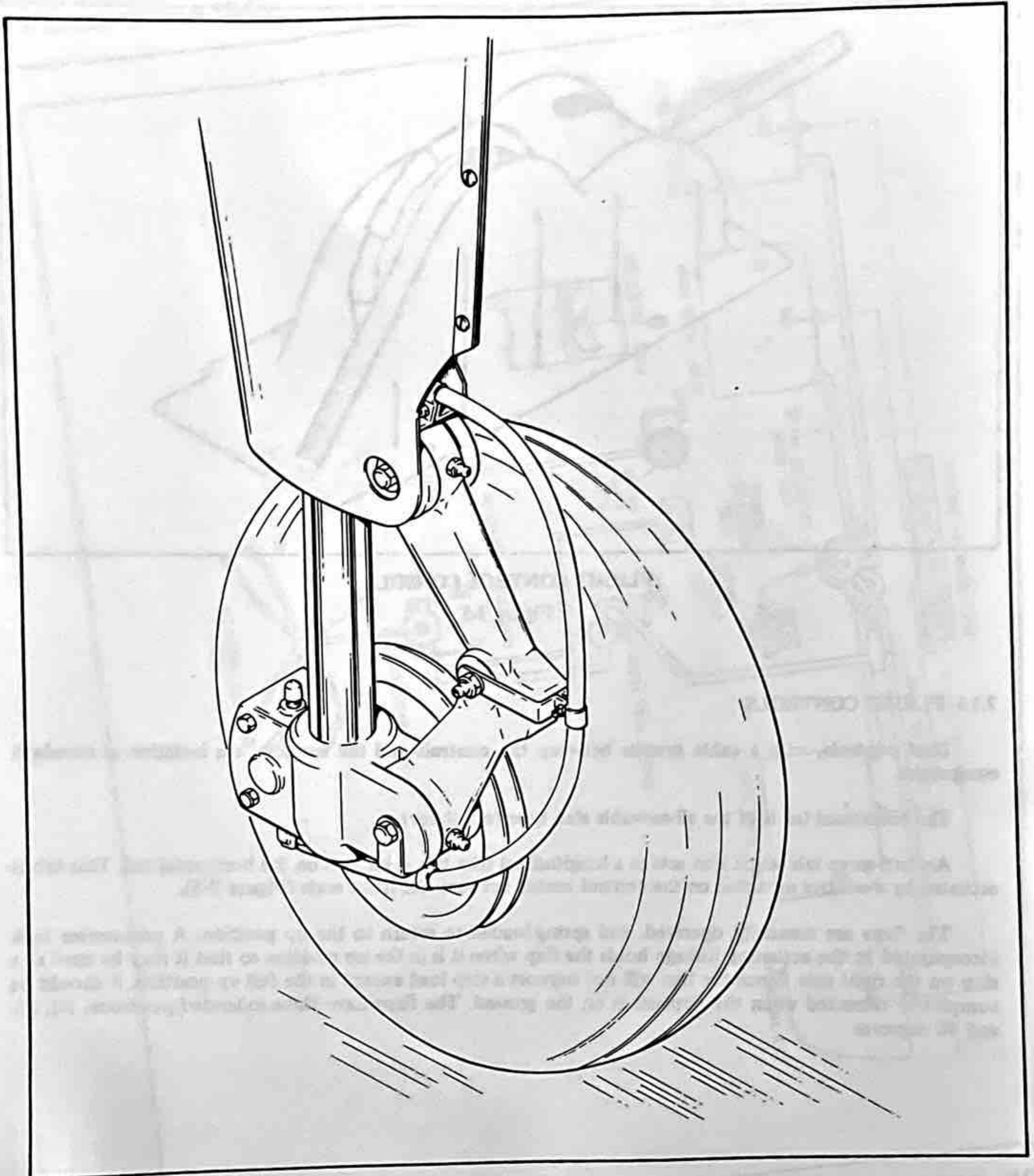
All three landing gear use Cleveland 6.00 x 6 wheels. The main gear have brake drums and Cleveland double disc hydraulic brake assemblies (Figure 7-3). The nose wheel carries a 6.00 x 6 four or six ply tire and the main gear use 6.00 x 6 six ply tires. All three tires are tube type.

The nose gear is steerable using a combination of full rudder pedal travel and brakes. The nose gear can be turned 24° each side of center. A spring device is incorporated in the rudder pedal torque tube assembly to aid in rudder centering and to provide rudder trim. The nose gear also includes a shimmy dampener.

The oleo struts are of the air-oil type. The normal extensions are 3-1/4 inches for the nose gear and 4-1/2 inches for the main gear under normal static load (empty weight of airplane plus full fuel and oil).

The brakes are operated by toe pedals attached to the rudder pedals or by a hand lever and master cylinder located below and behind the left center of the instrument sub-panel. Hydraulic cylinders are located above each pedal and adjacent to the hand lever. The brake fluid reservoir is on the top left front of the fire wall. The parking brake is incorporated in the lever brake and is engaged by pulling back on the lever and depressing the knob attached to the top of the handle. To release the parking brake, pull back on the brake lever to disengage the catch; then allow the handle to swing forward.

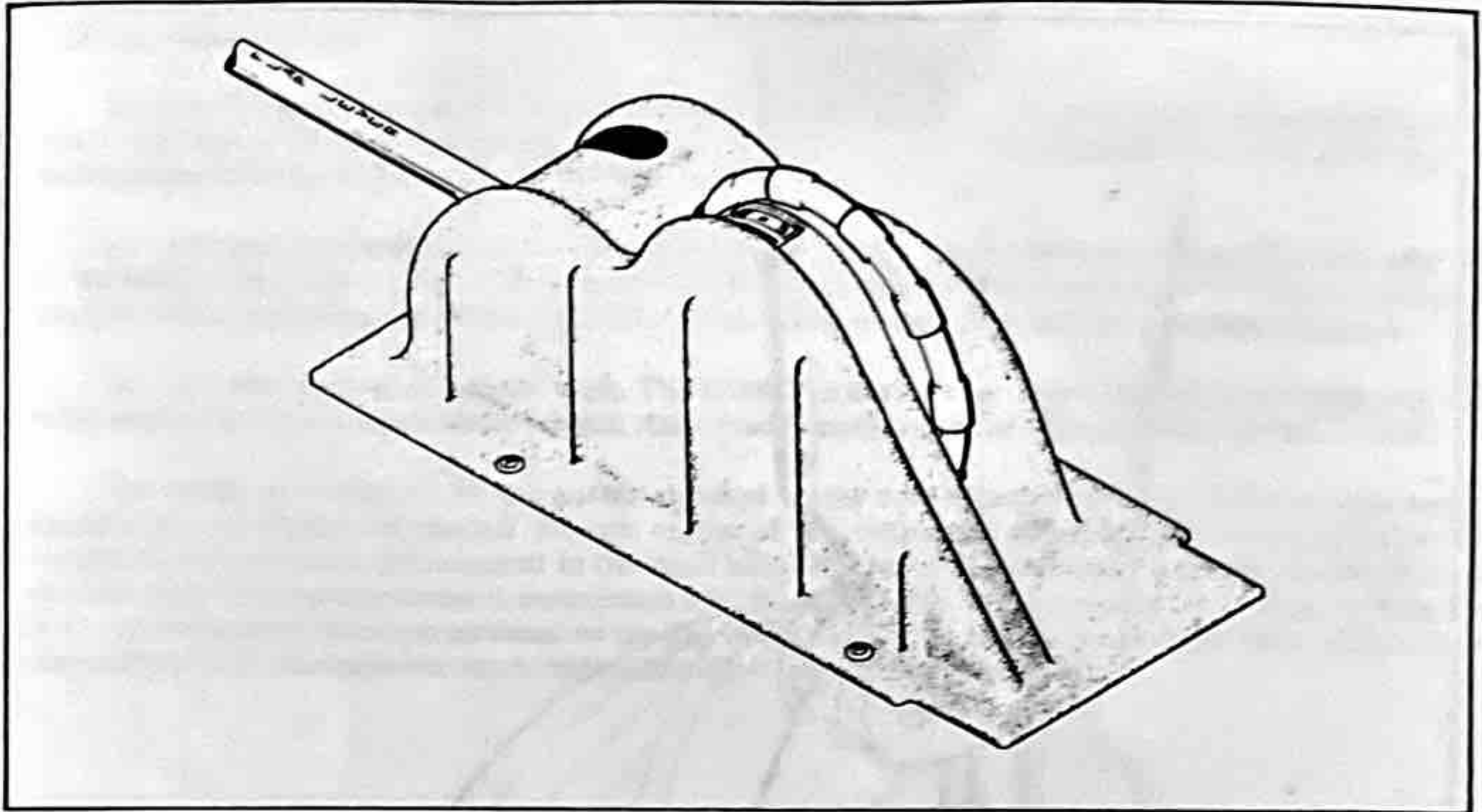




MAIN WHEEL ASSEMBLY

Figure 7-3





**FLIGHT CONTROL CONSOLE**

Figure 7-5

### 7.13 FLIGHT CONTROLS

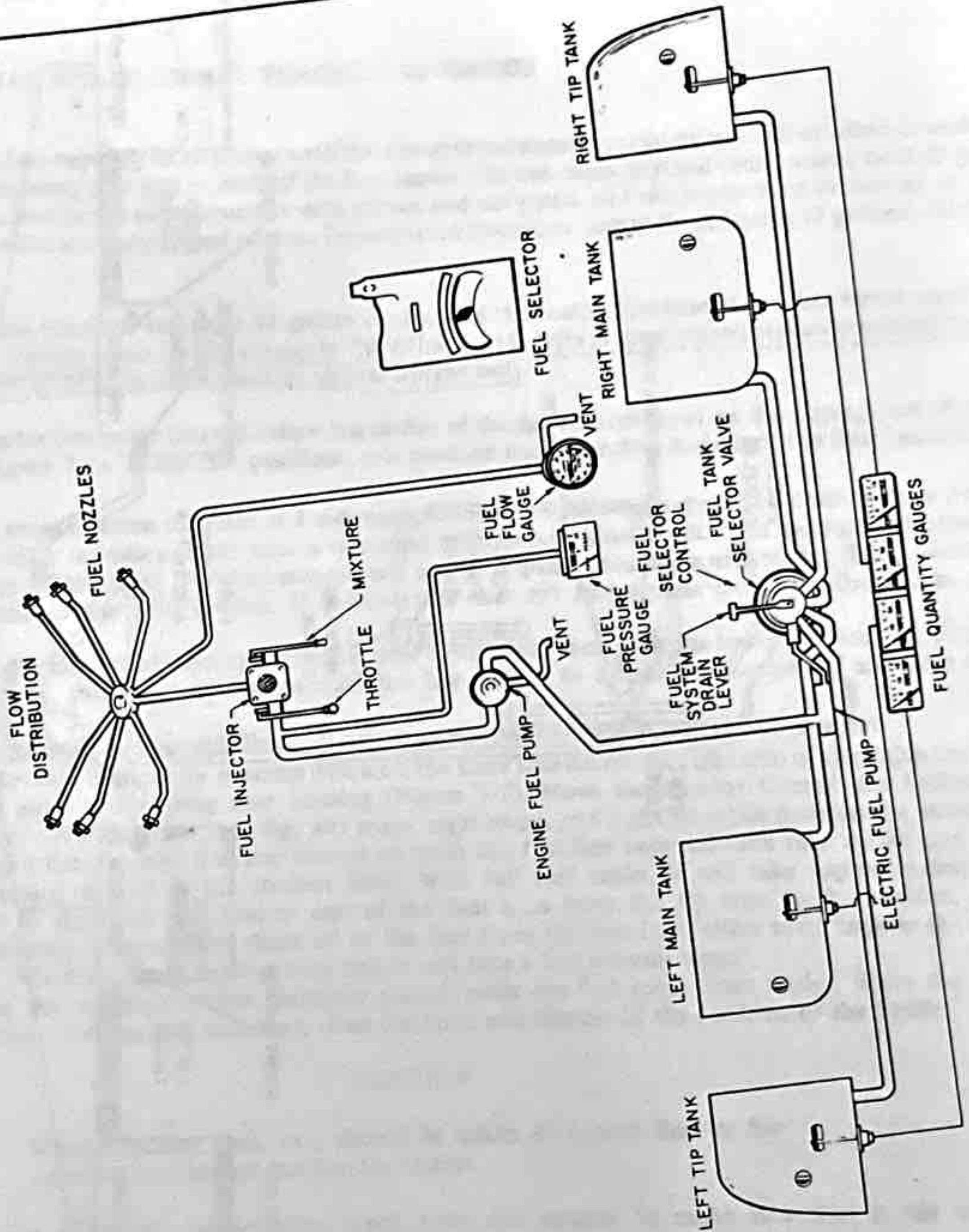
Dual controls, with a cable system between the controls and the surfaces, are installed as standard equipment.

The horizontal tail is of the all-movable slab type (stabilator).

An anti-servo tab which also acts as a longitudinal trim tab, is located on the horizontal tail. This tab is actuated by a control mounted on the control tunnel between the front seats (Figure 7-5).

The flaps are manually operated, and spring-loaded to return to the up position. A past-center lock incorporated in the actuating linkage holds the flap when it is in the up position so that it may be used as a step on the right side. Since the flap will not support a step load except in the full up position, it should be completely retracted when the airplane is on the ground. The flaps have three extended positions, 10, 25, and 40 degrees.

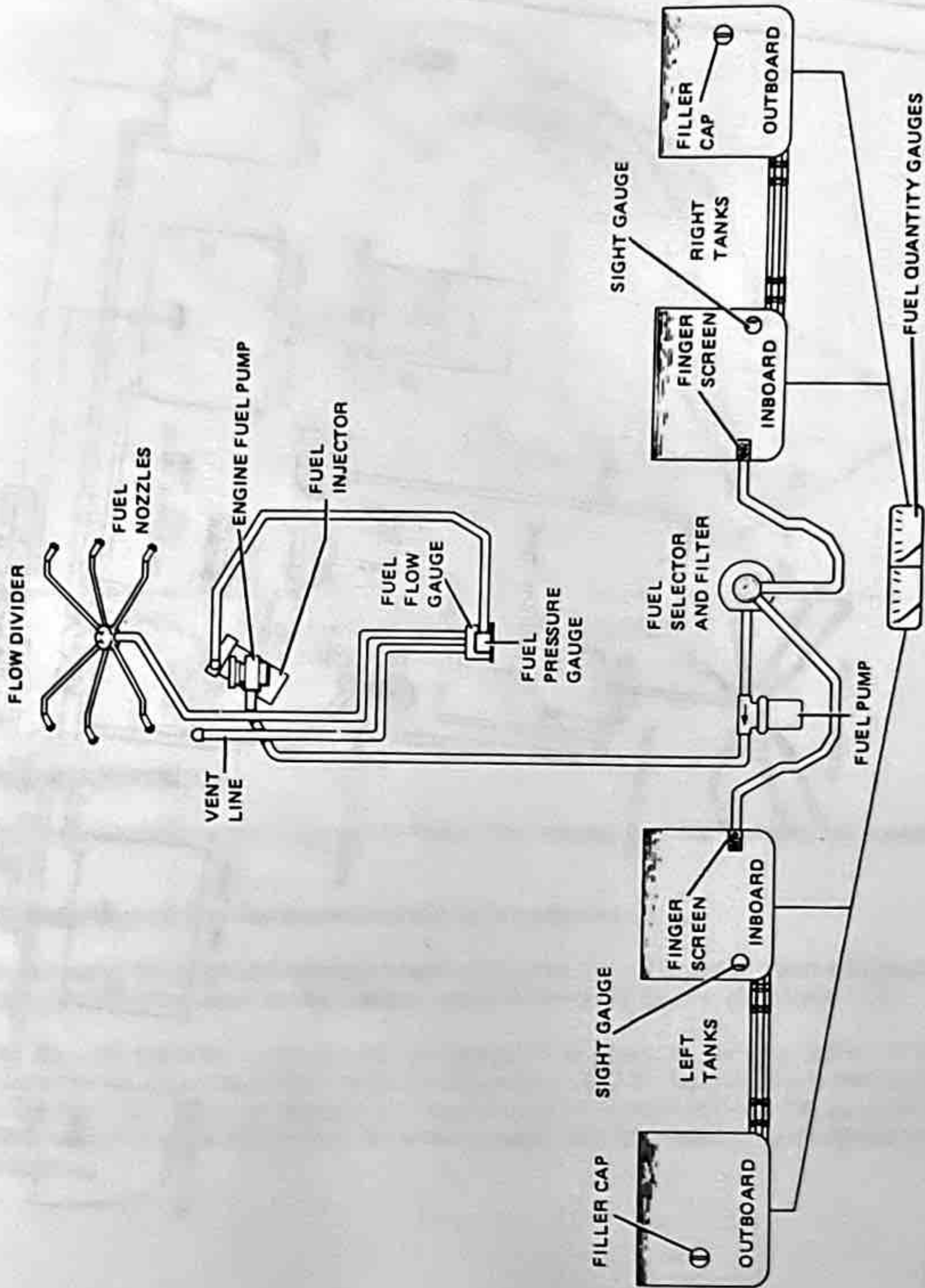




FUEL SYSTEM SCHEMATIC (SERIAL NOS. 32-7740001 THROUGH 32-7840202)  
Figure 7-7

REPORT:





FUEL SYSTEM SCHEMATIC (SERIAL NOS. 32-7940001 AND UP)

Figure 7-7a



## 7.15 FUEL SYSTEM

### AIRPLANES SERIAL NOS. 32-7740001 THROUGH 32-7840202

The standard fuel capacity of airplanes with the above serial numbers is 84 gallons, all of which is usable except for approximately one pint in each of the four tanks. The two main inboard tanks, which hold 25 gallons each, are attached to the wing structure with screws and nut plates and can be removed for service or inspection. The tip tanks are constructed of resin impregnated fiberglass, and each one holds 17 gallons. (Refer to Figure 7-7.)

When using less than the standard 84 gallon capacity of the tanks, fuel should be distributed equally between each side. The tip tanks should always be filled first, and fuel from the main tanks should be used first. All weight in excess of 3112 pounds must be in fuel weight only.

The fuel selector control is located below the center of the instrument panel on the sloping face of the control tunnel (Figure 7-1). It has five positions, one position corresponding to each of the four tanks plus an OFF position.

To avoid the accumulation of water and sediment, the fuel system sumps should be drained daily prior to first flight and after refueling. Each tank is equipped with an individual quick drain located at the lower inboard rear corner of the tank. The fuel strainer and a system quick drain valve are located in the fuselage at the lowest point of the fuel system. It is important that the fuel system sumps be drained in the following manner:

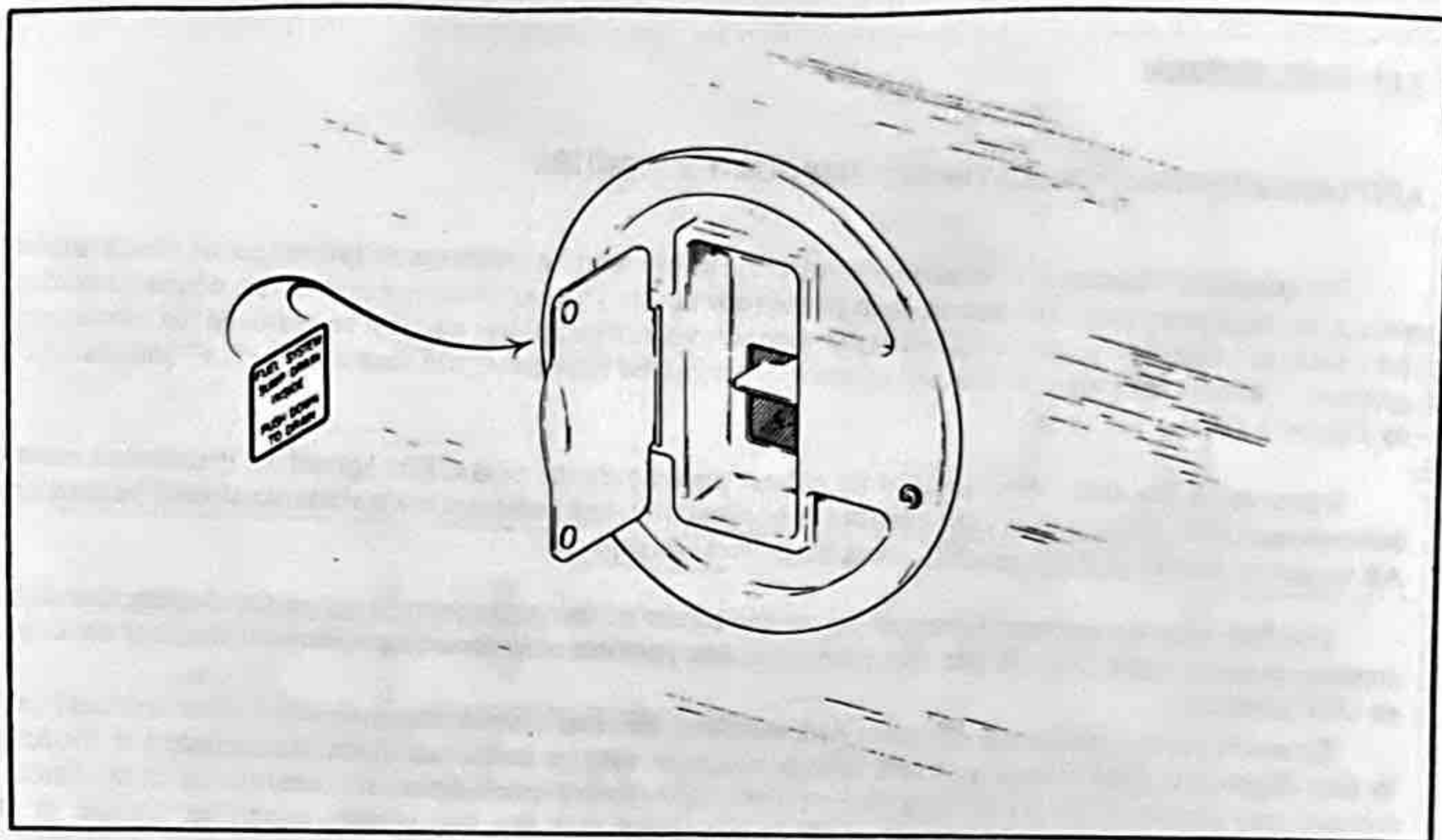
1. Drain each tank sump through its individual quick drain located at the lower inboard rear corner of the tank, making sure that enough fuel has flowed to ensure the removal of all water and sediment.
2. Place a container beneath the fuel sump drain outlet located under the fuselage.
3. Drain the fuel strainer by pressing down on the lever located on the right side of the cabin on the forward edge of the wing spar housing (Figure 7-9). Move the selector through the following sequence: OFF position, left tip, left main, right main, and right tip while draining the strainer. Make sure that enough fuel has flowed to drain the fuel line between each tank outlet and the fuel strainer, as well as the strainer itself. With full fuel tanks, it will take approximately 11 seconds to drain all the fuel in one of the fuel lines from the tip tank to the strainer, and approximately 6 seconds to drain all of the fuel from the line from either main tank to the fuel strainer. When the tanks are less than full, it will take a few seconds longer.
4. Examine the contents of the container placed under the fuel sump drain outlet. When the fuel flow is free of water and sediment, close the drain and dispose of the contents of the bottle.

### CAUTION

When draining fuel, care should be taken to ensure that no fire hazard exists before starting the engine.

After using the underseat quick drain, check from the outside to make sure that it has closed completely and is not leaking.





**FUEL DRAIN LEVER**

Figure 7-9

Fuel quantity gauges for each of the four tanks are located in the engine gauge cluster on the left side of the instrument panel. A fuel pressure indicator is also incorporated in the engine gauge cluster on earlier models.

An electric fuel pump is provided for use in case of failure of the engine driven pump. The electric pump operates from a single switch and independent circuit protector. It should be ON for all takeoffs and landings.

#### AIRPLANE SERIAL NOS. 32-7940001 AND UP

The standard fuel capacity of airplanes with the above serial numbers is 98 gallons, of which 94 gallons are usable. The tanks are attached to the wing structure with screws and nut plates and can be removed for service or inspection.

When using less than the standard 98 gallon capacity of the tanks, fuel should be distributed equally between each side.

The fuel selector control is located below the center of the instrument panel on the sloping face of the control tunnel (refer to Figure 7-1a). It has three positions, one position corresponding to each wing tank plus an OFF position.



To avoid the accumulation of water and sediment, the fuel tank sumps and strainer should be drained daily prior to first flight and after refueling. Each tank is equipped with an individual quick drain located at the lower inboard rear corner of the tank. The fuel strainer and a system quick drain valve are located in the fuselage at the lowest point of the fuel system. It is important that the fuel system be drained in the following manner:

1. Drain each tank sump through its individual quick drain located at the lower inboard rear corner of the tank, making sure that enough fuel has flowed to ensure the removal of all water and sediment.
2. Place a container beneath the fuel strainer sump drain outlet located under the fuselage.
3. Drain the fuel strainer sump by pressing down on the lever located on the right side of the cabin on the forward edge of the wing spar housing (Figure 7-9). Move the selector through the following sequence: OFF position, left, right, while draining the strainer sump. Make sure that enough fuel has flowed to drain the fuel line between each tank outlet and the fuel strainer, as well as the strainer itself. With full fuel tanks, it will take approximately 6 seconds to drain all of the fuel from the line from either tank to the fuel strainer. When the tanks are less than full, it will take a few seconds longer.
4. Examine the contents of the container placed under the fuel sump drain outlet. When the fuel flow is free of water and sediment, close the drain and dispose of the contents of the bottle.

#### CAUTION

When draining fuel, care should be taken to ensure that no fire hazard exists before starting the engine.

After using the underseat quick drain, check from the outside to make sure that it has closed completely and is not leaking.

Fuel quantity gauges for each of the tanks are located in the engine gauge cluster on the left side of the instrument panel. A fuel pressure indicator is also incorporated in the engine gauge cluster.

A fuel quantity indicator to measure the fuel not visible through the filler neck in each wing is installed in the inboard fuel tank. This gauge indicates usable fuel quantities from 5 gallons to 25 gallons in the ground attitude. The sole purpose of this gauge is to assist the pilot in determining fuel quantities of less than 25 gallons during the preflight inspection.

An electric fuel pump is provided for use in case of failure of the engine driven pump. The electric pump operates from a single switch and independent circuit protector. It should be ON for all takeoffs and landings.



## 7.17 ELECTRICAL SYSTEM

The 14-volt electrical system includes a 12-volt battery for starting and to back up alternator output (Figure 7-11). Electrical power is supplied by a 60 ampere alternator. The battery, a master switch relay, a voltage regulator and an overvoltage relay are located beneath the floor of the forward baggage compartment, and access is obtained by removing the floor.

Electrical switches are located on a panel to the pilot's left (Figure 7-13) and all circuit breakers are on the lower right instrument panel (Figure 7-15). A switch panel light is available as optional equipment. The light is installed above the switch panel and is controlled by a rheostat switch mounted on the left side of the panel. Two thumb-wheel rheostat switches to the left of the circuit breakers control the navigation lights and the intensity of the instrument panel lights.

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

The annunciator panel includes alternator and low oil pressure indicator lights. When the optional gyro system is installed, the annunciator panel also includes a low vacuum indicator light. The annunciator panel lights are provided only as a warning to the pilot that a system may not be operating properly, and that he should check and monitor the applicable system gauge to determine when or if any necessary action is required.

Optional electrical accessories include the navigation lights, an anti-collision light, instrument panel lighting, and cabin courtesy lights.

### WARNING

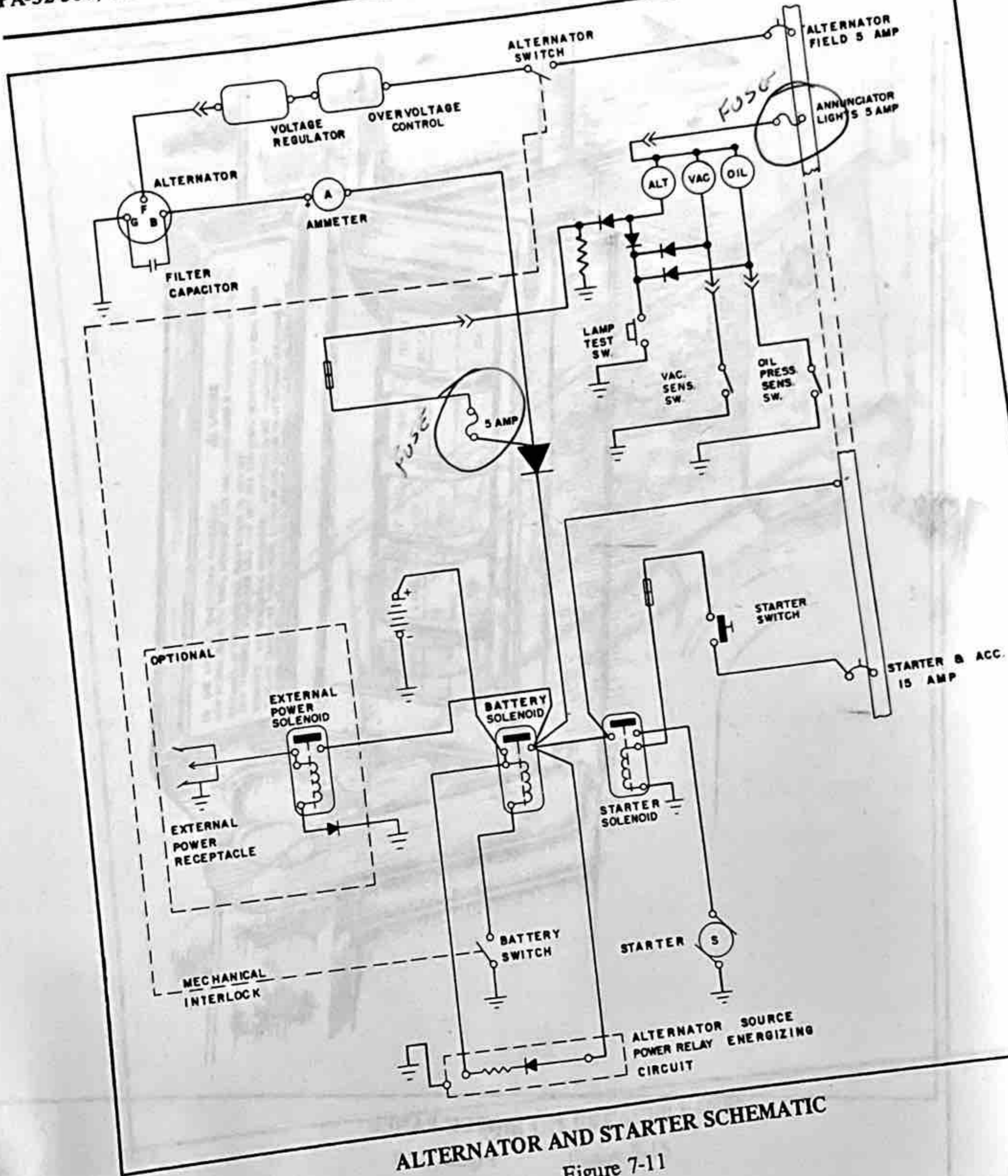
Strobe lights should not be operating when flying through overcast and clouds since reflected light can produce spacial disorientation. Do not operate strobe lights in close proximity to ground, during takeoff and landing.

The cabin courtesy light system consists of a forward entrance light located above the cockpit door and a rear entrance light which replaces the aft left reading light over the cabin door. These lights are operated individually with switches which are incorporated as part of each light assembly. The courtesy light circuit is independent of the aircraft master switch; therefore, the lights can be operated regardless of the position of the master switch. Unless the engine is running, the courtesy lights should not be left on for extended time periods, as battery depletion could result.

Circuit provisions are made to handle the addition of communications and navigational equipment.



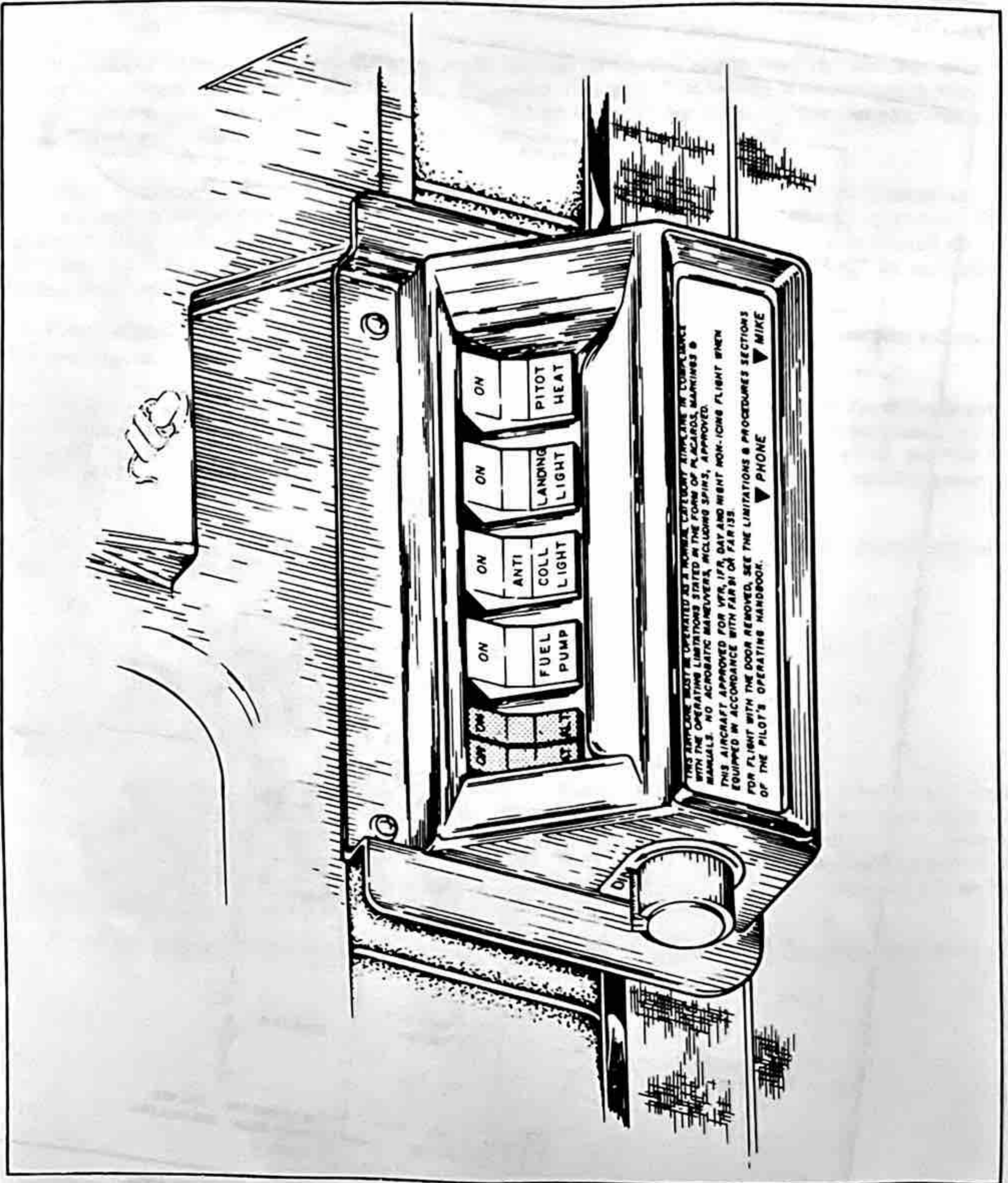
PIPER AIRCRAFT CORPORATION  
PA-32-300, CHEROKEE SIX



ALTERNATOR AND STARTER SCHEMATIC  
Figure 7-11

REPORT

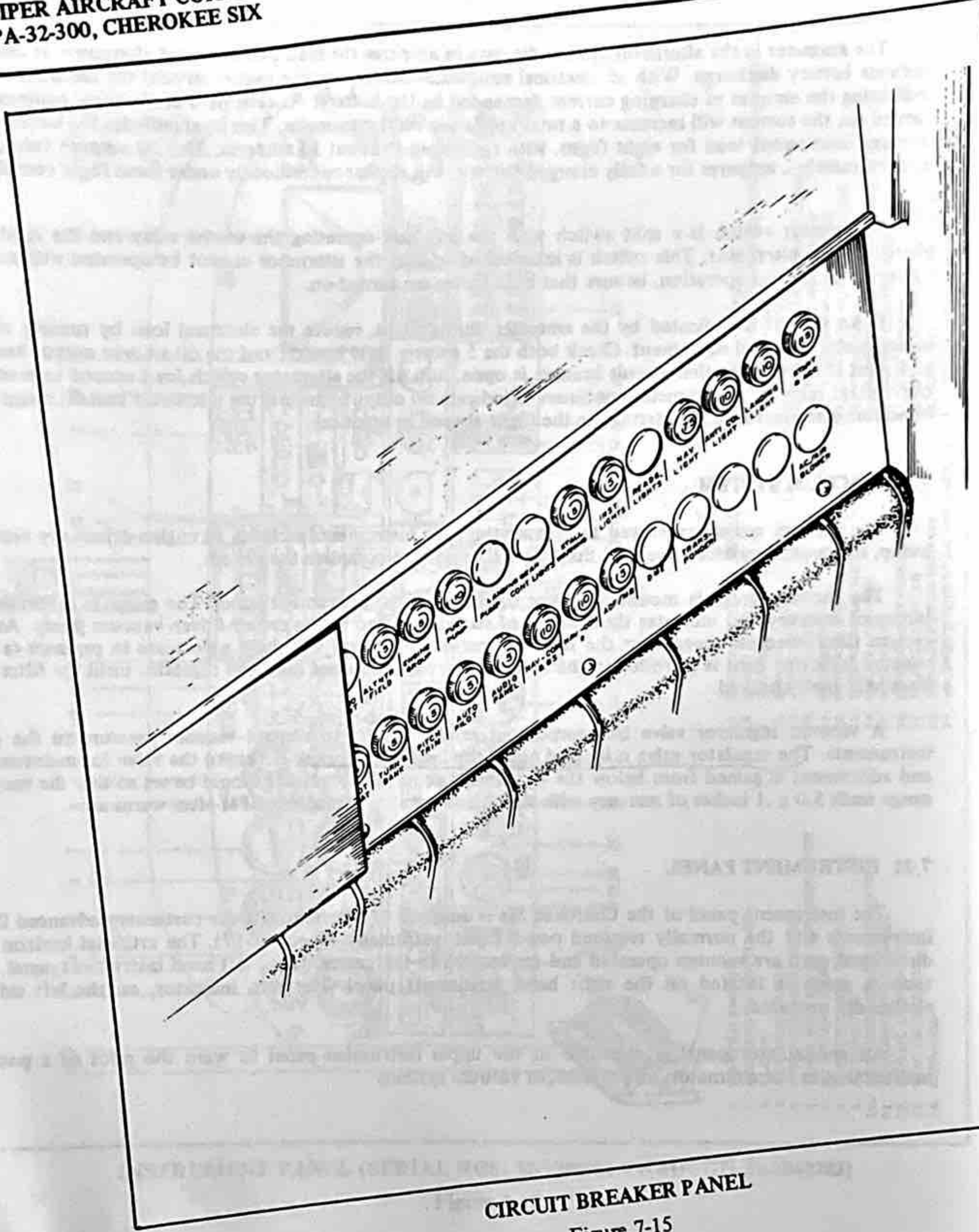




SWITCH PANEL

Figure 7-13





CIRCUIT BREAKER PANEL

Figure 7-15



The ammeter in the alternator system displays in amperes the load placed on the alternator. It does not indicate battery discharge. With all electrical equipment off (except the master switch) the ammeter will be indicating the amount of charging current demanded by the battery. As each item of electrical equipment is turned on, the current will increase to a total appearing on the ammeter. This total includes the battery. 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 master switch is a split switch with the left half operating the master relay and the right half energizing the alternator. This switch is interlocked so that the alternator cannot be operated without the battery. For normal operation, be sure that both halves are turned on.

If no output is indicated by the ammeter during flight, reduce the electrical load by turning off all unnecessary electrical equipment. Check both the 5 ampere field breaker and the 60 ampere output breaker and reset if open. If neither circuit breaker is open, turn off the alternator switch for 1 second to reset the overvoltage relay. If the ammeter continues to indicate no output, turn off the alternator switch; maintain a minimum electrical load; and terminate the flight as soon as practical.

#### 7.19 VACUUM SYSTEM

The vacuum system employed to operate the gyro instruments includes an engine-driven dry vacuum pump, a vacuum regulator valve, and the tubing necessary to complete the system.

The vacuum gauge is mounted on the right side of the instrument panel. The gauge is calibrated in inches of mercury and indicates the amount of suction created by the engine-driven vacuum pump. As the system filter becomes clogged or the lines obstructed, the gauge will show a decrease in pressure (a low vacuum indicator light is provided in the annunciator panel). Do not reset the regulator until the filter and lines have been checked.

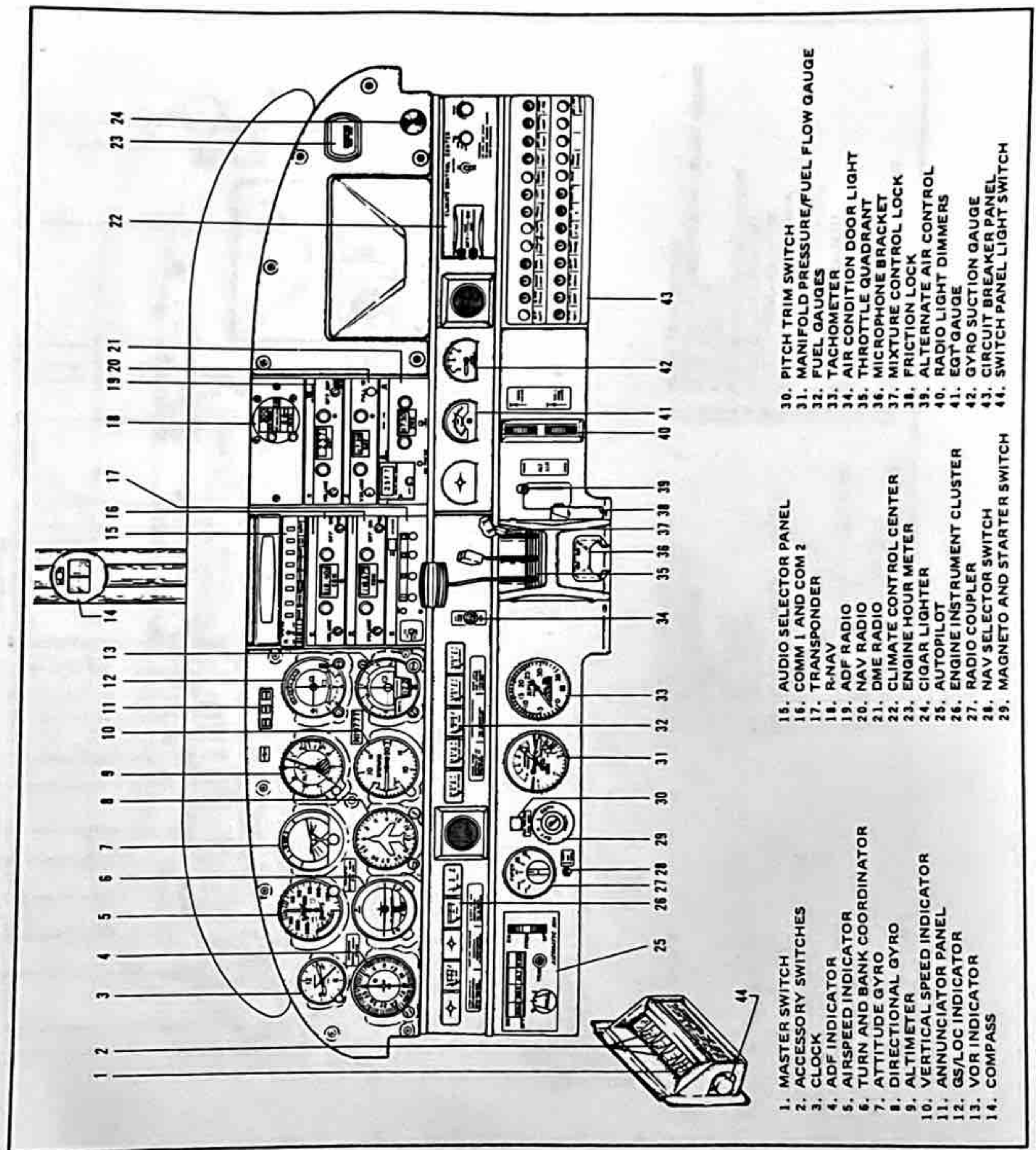
A vacuum regulator valve is incorporated in the system to control vacuum pressure to the gyro instruments. The regulator valve is located under the instrument panel. Access to the valve for maintenance and adjustment is gained from below the instrument panel. The regulator should be set so that the vacuum gauge reads  $5.0 \pm .1$  inches of mercury with the engine running at medium RPM after warm-up.

#### 7.21 INSTRUMENT PANEL

The instrument panel of the Cherokee Six is designed to accommodate the customary advanced flight instruments and the normally required power plant instruments (Figure 7-17). The artificial horizon and directional gyro are vacuum operated and are located in the center of the left hand instrument panel. The vacuum gauge is located on the right hand instrument panel. The turn indicator, on the left side, is electrically operated.

An 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.



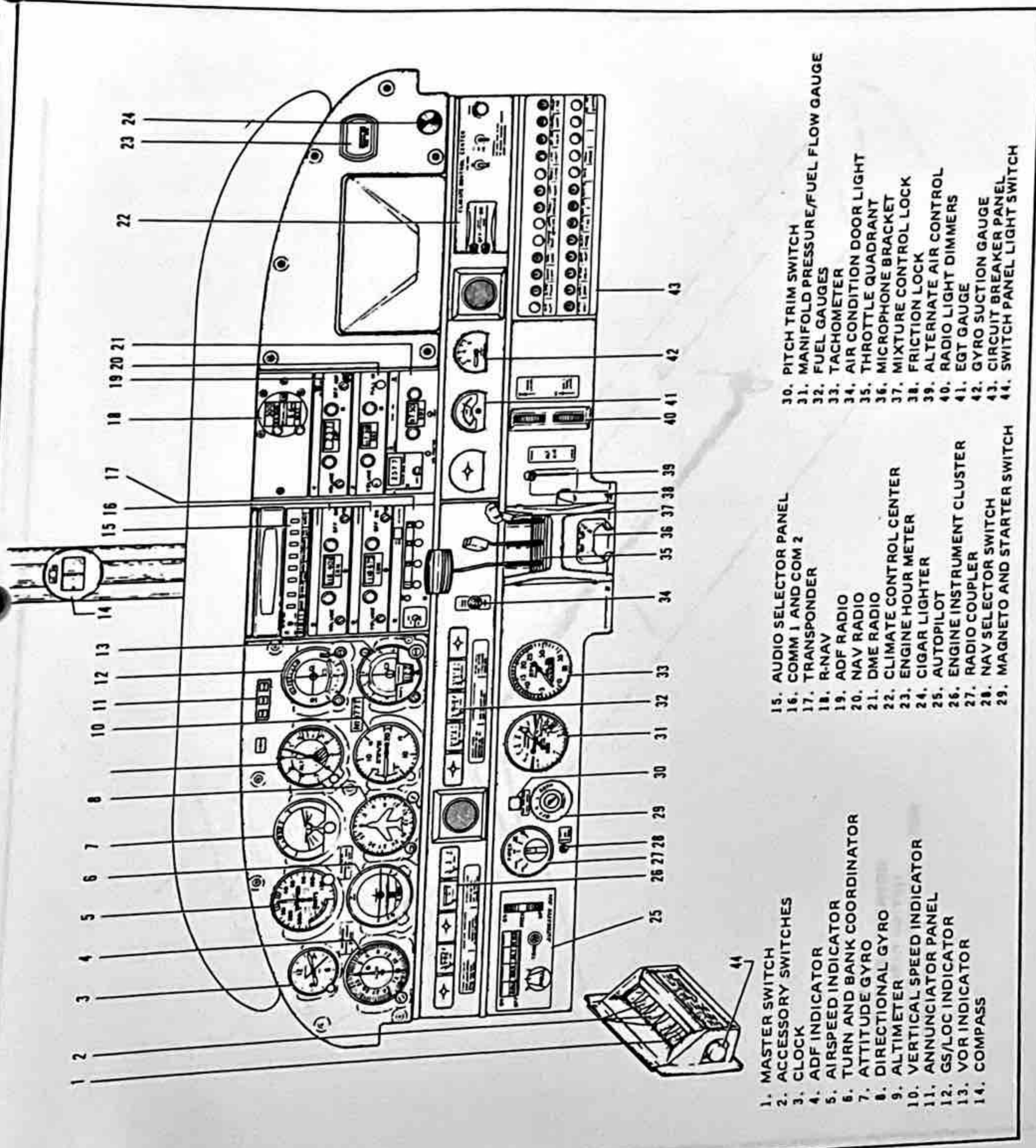


- |                              |                                |                                       |
|------------------------------|--------------------------------|---------------------------------------|
| 1. MASTER SWITCH             | 15. AUDIO SELECTOR PANEL       | 30. PITCH TRIM SWITCH                 |
| 2. ACCESSORY SWITCHES        | 16. COMM 1 AND COM 2           | 31. MANIFOLD PRESSURE/FUEL FLOW GAUGE |
| 3. CLOCK                     | 17. TRANSPONDER                | 32. FUEL GAUGES                       |
| 4. ADF INDICATOR             | 18. R-NAV                      | 33. TACHOMETER                        |
| 5. AIRSPEED INDICATOR        | 19. ADF RADIO                  | 34. AIR CONDITION DOOR LIGHT          |
| 6. TURN AND BANK COORDINATOR | 20. NAV RADIO                  | 35. THROTTLE QUADRANT                 |
| 7. ATTITUDE GYRO             | 21. DME RADIO                  | 36. MICROPHONE BRACKET                |
| 8. DIRECTIONAL GYRO          | 22. CLIMATE CONTROL CENTER     | 37. MIXTURE CONTROL LOCK              |
| 9. ALTIMETER                 | 23. ENGINE HOUR METER          | 38. FRICTION LOCK                     |
| 10. VERTICAL SPEED INDICATOR | 24. CIGAR LIGHTER              | 39. ALTERNATE AIR CONTROL             |
| 11. ANNUNCIATOR PANEL        | 25. AUTOPILOT                  | 40. RADIO LIGHT DIMMERS               |
| 12. GS/LOC INDICATOR         | 26. ENGINE INSTRUMENT CLUSTER  | 41. EGT GAUGE                         |
| 13. VOR INDICATOR            | 27. RADIO COUPLER              | 42. GYRO SUCTION GAUGE                |
| 14. COMPASS                  | 28. NAV SELECTOR SWITCH        | 43. CIRCUIT BREAKER PANEL             |
|                              | 29. MAGNETO AND STARTER SWITCH | 44. SWITCH PANEL LIGHT SWITCH         |

INSTRUMENT PANEL (SERIAL NOS. 32-7740001 THROUGH 32-7840202)

Figure 7-17



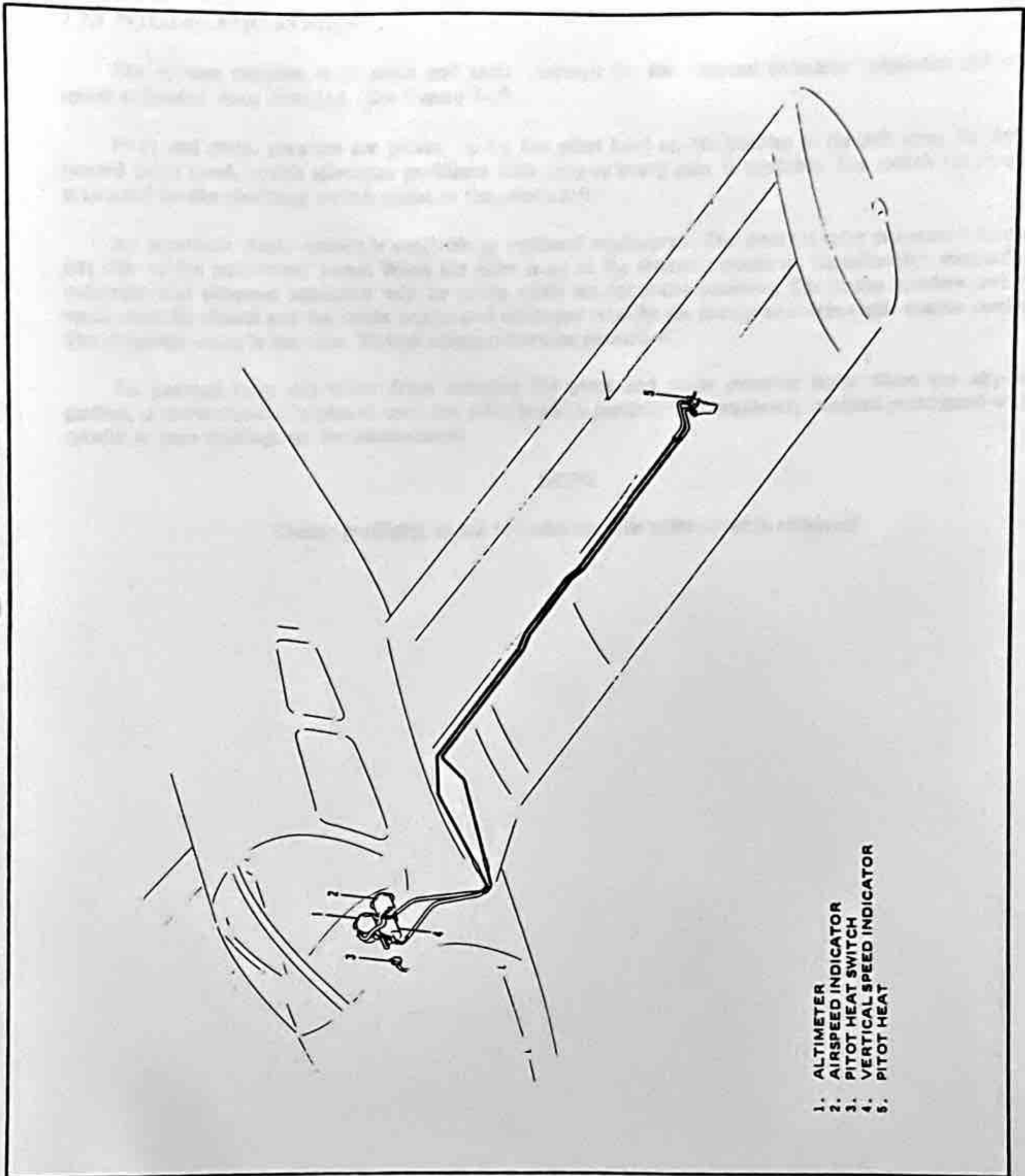


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|--------------------------------|---------------------------------------|
| 1. MASTER SWITCH               | 30. PITCH TRIM SWITCH                 |
| 2. ACCESSORY SWITCHES          | 31. MANIFOLD PRESSURE/FUEL FLOW GAUGE |
| 3. CLOCK                       | 32. FUEL GAUGES                       |
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| 7. ATTITUDE GYRO               | 36. MICROPHONE BRACKET                |
| 8. DIRECTIONAL GYRO            | 37. MIXTURE CONTROL LOCK              |
| 9. ALTIMETER                   | 38. FRICTION LOCK                     |
| 10. VERTICAL SPEED INDICATOR   | 39. ALTERNATE AIR CONTROL             |
| 11. ANNUNCIATOR PANEL          | 40. RADIO LIGHT DIMMERS               |
| 12. GS/LOC INDICATOR           | 41. EGT GAUGE                         |
| 13. VOR INDICATOR              | 42. GYRO SUCTION GAUGE                |
| 14. COMPASS                    | 43. CIRCUIT BREAKER PANEL             |
|                                | 44. SWITCH PANEL LIGHT SWITCH         |
| 15. AUDIO SELECTOR PANEL       |                                       |
| 16. COMM 1 AND COM 2           |                                       |
| 17. TRANSPONDER                |                                       |
| 18. R-NAV                      |                                       |
| 19. ADF RADIO                  |                                       |
| 20. NAV RADIO                  |                                       |
| 21. DME RADIO                  |                                       |
| 22. CLIMATE CONTROL CENTER     |                                       |
| 23. ENGINE HOUR METER          |                                       |
| 24. CIGAR LIGHTER              |                                       |
| 25. AUTOPILOT                  |                                       |
| 26. ENGINE INSTRUMENT CLUSTER  |                                       |
| 27. RADIO COUPLER              |                                       |
| 28. NAV SELECTOR SWITCH        |                                       |
| 29. MAGNETO AND STARTER SWITCH |                                       |

INSTRUMENT PANEL (SERIAL NOS. 32-7940001 AND UP)

Figure 7-17a





PITOT-STATIC SYSTEM

Figure 7-19



### 7.23 PITOT-STATIC SYSTEM

The system supplies both pitot and static pressure for the airspeed indicator, altimeter and vertical speed indicator when installed. (See Figure 7-19.)

Pitot and static pressure are picked up by the pitot head on the bottom of the left wing. An optional heated pitot head, which alleviates problems with icing or heavy rain, is available. The switch for pitot heat is located on the electrical switch panel to the pilot's left.

An alternate static source is available as optional equipment. The control valve is located below the left side of the instrument panel. 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.

To prevent bugs and water from entering the pitot and static pressure holes when the airplane is parked, a cover should be placed over the pitot head. A partially or completely blocked pitot head will give erratic or zero readings on the instruments.

#### NOTE

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



An optional club seating interior is also available. In the club seating interior the center seats face aft. These seats are equipped with lap belts only. Removal of the seats is accomplished by removing the two bolts holding the aft attach points and sliding the seat aft.

An optional refreshment console is located between the center seats. It is removed in an identical manner to the center seats.

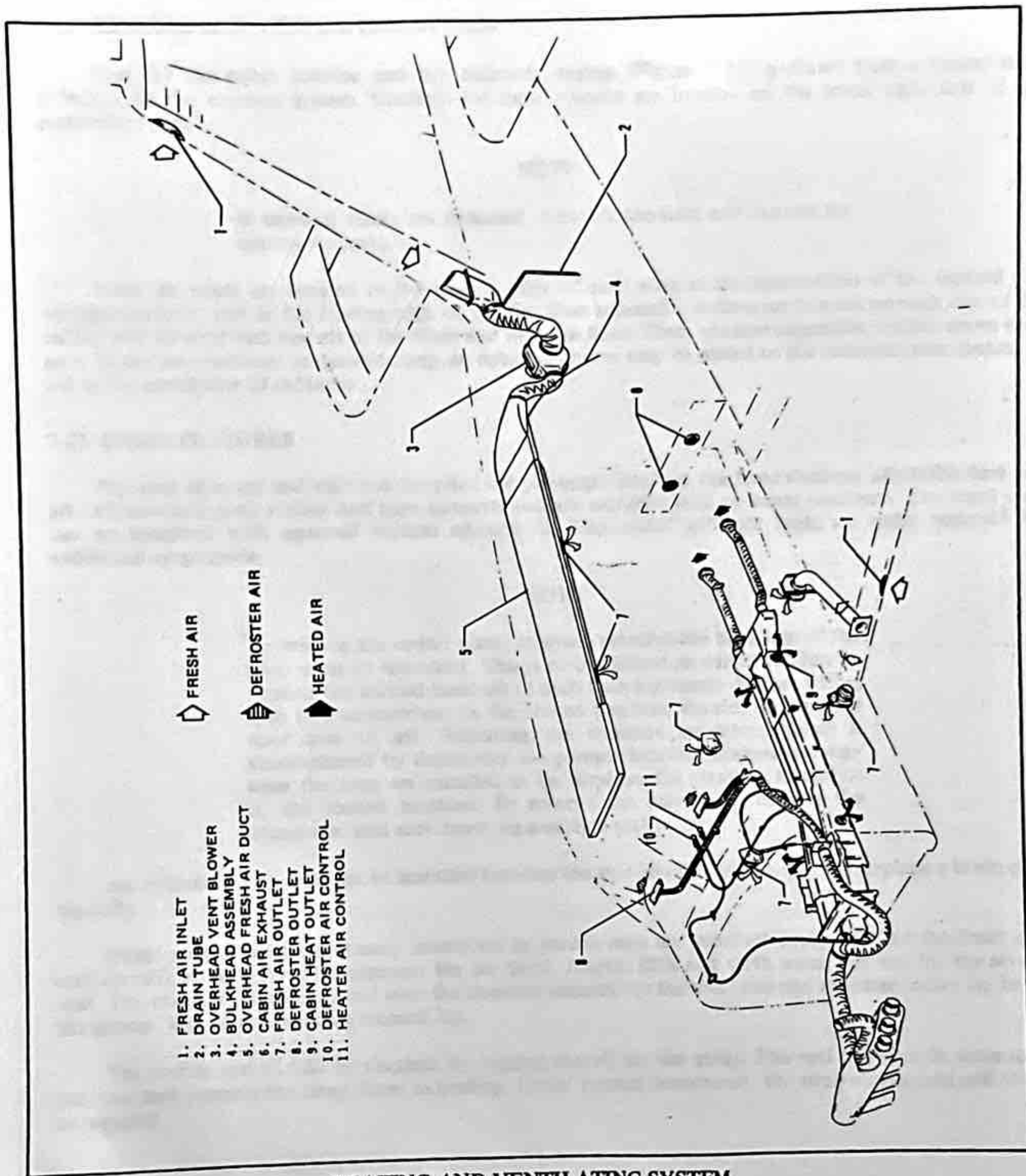
An optional cabin work table, serving the two seats on the right side of the passenger cabin, is offered to the club seating arrangement. The table must be stowed during takeoff and landing. If the table is to be used, it should be set up after a level cruise is established.

To remove the cabin work table from the aft baggage compartment, unlock the stud located on the bottom of the close-out bulkhead. Loosen the white tie-down strap and remove the table from the mounting brackets by lifting the table two inches straight up until it clears the mounting brackets. Do not twist the table while it is in the brackets.

To install the cabin work table during flight, hold the table in place and tilt the free end of the table upward 30° until the lobed upper knobs on the table supports align with the top holes of the escutcheons located below the right cabin window trim. Hold the upper lobes in place and lower the free end of the table to the level work position. The retaining springs will click when secure.

To stow the cabin work table, remove the table by lifting the free end of the table upward to disengage the bottom lobes of the table supports. Lift until the top support lobes disengage at approximately 30° of tilt and remove the table. Position the table in the stowage area and, with the table work surface facing forward, place the slots in the table support into the receptacle clips mounted on the hat shelf. Make sure the white tie-down strap is not behind the table. With the table fully placed in the clips, bring the white tie-down strap across the face of the table and lock over the stud located on the bottom of the close-out bulkhead.





HEATING AND VENTILATING SYSTEM

Figure 7-21



## 7.25 HEATING AND VENTILATING SYSTEM

Heat for the cabin interior and the defroster system (Figure 7-21) is drawn from a heater muff attached to the exhaust system. Controls for these systems are located on the lower right side of the instrument panel.

### NOTE

If unusual odors are detected, turn off the heat and inspect the system for leaks.

Fresh air inlets are located in the leading edge of each wing at the intersection of the tapered and straight sections, and in the leading edge of the fin. Two adjustable outlets are located on each side of the cabin, one forward and one aft of the front seat near the floor. There are also adjustable outlets above each seat. In airplanes without air conditioning, an optional blower may be added to the overhead vent system to aid in the circulation of cabin air.

## 7.27 CABIN FEATURES

For ease of entry and exit and for pilot and passenger comfort, the front seats are adjustable fore and aft. All standard seats recline and have armrests and are available with optional headrests. The front seats can be equipped with optional vertical adjustment. The center and rear seats are easily removed for additional cargo space.

### NOTE

To remove the center seats, retainers securing the back legs of the seats must be unlocked. This is accomplished on earlier models by turning the slotted head aft of each back leg ninety degrees with a coin or a screwdriver. In the locked position, the slot on the head runs fore to aft. Releasing the retainers on later models is accomplished by depressing the plunger behind each rear leg. Any time the seats are installed in the airplane, the retainers should be in the locked position. To remove the rear seats, depress the plunger behind each front leg and slide seat to rear.

An optional jump seat can be installed between the two middle seats to give the airplane a seven-place capacity.

Single strap shoulder harnesses controlled by inertia reels are standard equipment for the front seats and are offered as optional equipment for the third, fourth, fifth and sixth seats, but not for the seventh seat. The shoulder strap is routed over the shoulder adjacent to the windows and attached to the lap belt in the general area of the person's inboard hip.

The inertia reel should be checked by tugging sharply on the strap. The reel will lock in place under this test and prevent the strap from extending. Under normal movement, the strap will extend and retract as required.



### 7.35 AIR CONDITIONING\*

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

The evaporator is located behind the rear baggage compartment. This cools the air used for the air conditioning system.

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 optional electric blower is mounted on the aft side of the rear cabin panel. Air from the baggage 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 temperature of the cabin. Turning the control clockwise increases cooling; counterclockwise decreases cooling.

The fan speed switch and the air conditioning ON-OFF switch are inboard of the temperature control. The fan can be operated independently of the air conditioning; however, the fan 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.

The fan switch allows operation of the fan with the air conditioner turned OFF to aid in cabin air circulation. On early models "LOW", "MED" or "HIGH" can be selected to direct a flow of air through the air conditioner outlets in the overhead duct. On later models a toggle switch marked "HI", "OFF" or "LO" is used for this function. The outlets can be adjusted or turned off individually.

The condenser door light is located to the right of the engine instrument cluster in front of the pilot. The door light illuminates when the door is open and is off when the door is closed.

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

Whenever the throttle is in the full forward position, it actuates a micro switch which disengages the compressor and retracts the scoop. This allows maximum power and maximum rate of climb. The fan continues to operate and the air will remain cool for about one minute. When the throttle is retarded approximately 1/4 inch, the clutch will engage, the scoop will extend, and the system will again supply cool, dry air.

\*Optional equipment



### **7.29 BAGGAGE AREA**

The airplane has two separate baggage areas, each with a 100 pound capacity. An 8 cubic foot forward luggage compartment, located just aft of the firewall, is accessible through a 16 x 22 inch door on the right side of the fuselage. A 17.3 cubic foot aft compartment is located behind the fifth and sixth seats and is accessible during flight from inside the cabin.

An automatic forward baggage light feature is available which utilizes a magnetic reed switch and a magnet for activation. The switch and magnet are mounted just above the hinge line of the forward baggage door.

Opening the baggage door fully causes activation of the switch which illuminates the baggage light. The baggage light is independent of the aircraft master switch; therefore, the light will illuminate regardless of the position of the master switch. The baggage door should not be left open for extended time periods, as battery depletion could result.

#### **NOTE**

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

### **7.31 STALL WARNING**

An approaching stall is indicated by a stall warning indicator which is activated between five and ten knots above stall speed. Mild airframe buffeting and gentle pitching may also precede the stall. Stall speeds are shown on graphs in the Performance Charts Section. The stall warning indicator is a continuous sounding horn located behind the instrument panel. The stall warning indicator is activated by a lift detector installed on the leading edge of the left wing. During preflight, the stall warning system should be checked by turning the master switch "ON," lifting the detector and checking to determine if the indicator is actuated.

### **7.33 FINISH**

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



### 7.37 PIPER EXTERNAL POWER\*

An optional starting installation known as Piper External Power (PEP) is accessible through a receptacle located on the left side of the nose section aft of the cowling. 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.

### 7.39 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 is an emergency locator transmitter which 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.

### 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.

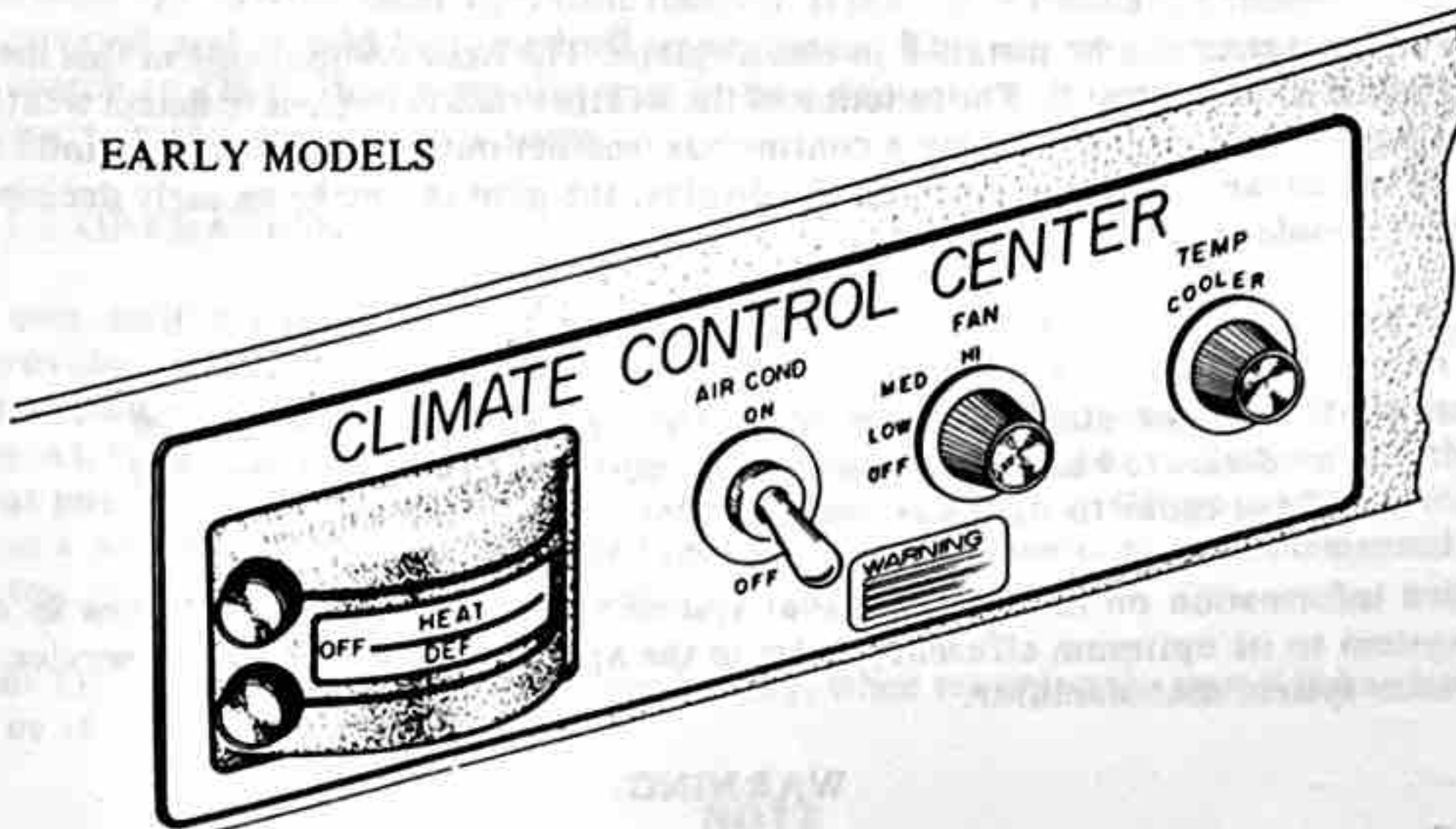
In the event the transmitter is activated by an impact, it can only be turned off by moving the switch on the ELT unit to OFF. Normal operation can then be restored by pressing the small clear plastic reset button located on the top of the front face of the ELT and then moving the switch to ARM.

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.

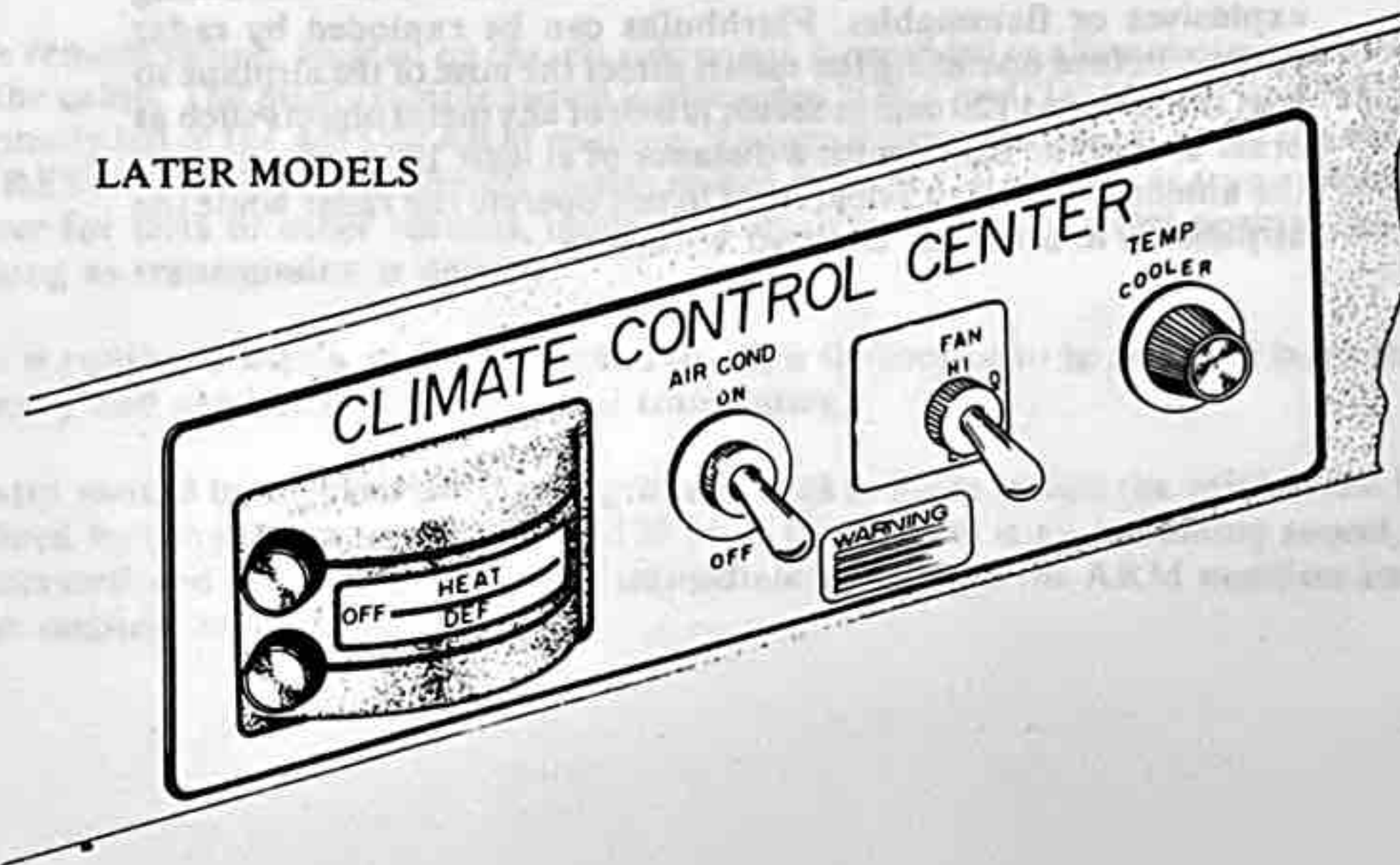
\*Optional Equipment



EARLY MODELS



LATER MODELS



CLIMATE CONTROL CENTER

Figure 7-23



### 7.41 RADAR\*

A weather radar system can be installed in this airplane. The basic components of this installation are a R-T/antenna and a cockpit indicator. The function of the weather radar system is to detect weather conditions along the flight path and to visually display a continuous weather outline on the cockpit indicator. Through interpretation of the advance warning given on the display, the pilot can make an early decision on the most desirable weather avoidance course.

#### NOTE

When operating weather avoidance radar systems inside of moderate to heavy precipitation, it is advisable to set the range scale of the radar to its lowest scale.

For detailed information on the weather radar system and for procedures to follow in operating and adjusting the system to its optimum efficiency, refer to the appropriate operating and service manuals provided by the radar system manufacturer.

#### WARNING

Heating and radiation effects of radar can cause serious damage to the eyes and tender organs of the body. Personnel should not be allowed within fifteen feet of the area being scanned by the antenna while the system is transmitting. Do not operate the radar during refueling or in the vicinity of trucks or containers accomodating explosives or flammables. Flashbulbs can be exploded by radar energy. Before operating the radar, direct the nose of the airplane so that the forward 120 degree sector is free of any metal objects such as other aircraft or hangers for a distance of at least 100 yards, and tilt the antenna upward 15 degrees. Do not operate the radar while the airplane is in a hangar or other enclosure.

\*Optional equipment



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 the transmitter is silent.

### CCC CIR 11-2 OPERATION

On the unit itself is a three position selector switch placarded "OFF," "ARM" and "ON." The ARM position is provided to set the unit to the automatic position so that it will transmit only after impact and will continue to transmit until the battery is drained to depletion or until the switch is manually moved to the OFF position. The ARM position is selected when the transmitter is installed at the factory and the switch should remain in that position whenever the unit is installed in the airplane. The ON position is provided so the unit can be used as a portable transmitter or in the event the automatic feature was not triggered by impact or to periodically test the function of the transmitter.

Select the OFF position when changing the battery, when rearming the unit if it has been activated for any reason, or to discontinue transmission.

#### NOTE

If the switch has been placed in the ON position for any reason, the OFF position has to be selected before selecting ARM. If ARM is selected directly from the ON position, the unit will continue to transmit in the ARM position.

A pilot's remote switch, located on the left side panel, is provided to allow the transmitter to be controlled from inside the cabin. The pilot's remote switch is placarded "ON," "AUTO/ARM" and "OFF/RESET." The switch is normally left in the AUTO/ARM position. To turn the transmitter off, move the switch momentarily to the OFF/RESET position. The aircraft master switch must be ON to turn the transmitter OFF. To actuate the transmitter for tests or other reasons, move the switch upward to the ON position and leave it in that position as long as transmission is desired.

The unit is equipped with a portable antenna to allow the locator to be removed from the aircraft in case of an emergency and used as a portable signal transmitter.

The locator should be checked during the ground check to make certain the unit has not been accidentally activated. Check by tuning a radio receiver to 121.50 MHz. If there is an oscillating sound, the locator may have been activated and should be turned off immediately. Reset to the ARM position and check again to insure against outside interference.



# TABLE OF CONTENTS

## SECTION 8

### AIRPLANE HANDLING, SERVICING AND MAINTENANCE

Paragraph No.		Page No.
8.1	General . . . . .	8-1
8.3	Airplane Inspection Periods . . . . .	8-3
8.5	Preventive Maintenance . . . . .	8-4
8.7	Airplane Alterations . . . . .	8-5
8.9	Ground Handling . . . . .	8-6
8.11	Engine Air Filter . . . . .	8-8
8.13	Brake Service . . . . .	8-8
8.15	Landing Gear Service . . . . .	8-10
8.17	Propeller Service . . . . .	8-11
8.19	Oil Requirements . . . . .	8-11
8.21	Fuel System . . . . .	8-11
8.23	Tire Inflation . . . . .	8-13
8.25	Battery Service . . . . .	8-13
8.27	Cleaning . . . . .	8-13



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## SECTION 8

### AIRPLANE HANDLING, SERVICING AND MAINTENANCE

#### 8.1 GENERAL

This section provides general guidelines relating to the handling, servicing and maintenance of the Cherokee Six.

Every owner should stay in close contact with his Piper dealer or distributor and Authorized Piper Service Center to obtain the latest information pertaining to his aircraft and to avail himself of the Piper Aircraft Service Back-up.

Piper Aircraft Corporation takes a continuing interest in having the owner get the most efficient use from his aircraft and keeping it in the best mechanical condition. Consequently, Piper Aircraft from time to time issues Service Bulletins, Service Letters and Service Spares Letters relating to the aircraft.

Service Bulletins are of special importance and should be complied with promptly. These are sent to the latest registered owners, distributors and dealers. Depending on the nature of the bulletin, material and labor allowances may apply, and will be addressed in the body of the Bulletin.

Service Letters deal with product improvements and service hints pertaining to the aircraft. They are sent to dealers, distributors and occasionally (at the factory's discretion) to latest registered owners, so they can properly service the aircraft and keep it up to date with the latest changes. Owners should give careful attention to the Service Letter information.

Service Spares Letters offer improved parts, kits and optional equipment which were not available originally and which may be of interest to the owner.

If an owner is not having his aircraft serviced by an Authorized Piper Service Center, he should periodically check with a Piper dealer or distributor to find out the latest information to keep his aircraft up to date.

Piper Aircraft Corporation has a Subscription Service for the Service Bulletins, Service Letters and Service Spares Letters. This service is offered to interested persons such as owners, pilots and mechanics at a nominal fee, and may be obtained through Piper dealers and distributors.

A service manual, parts catalog, and revisions to both, are available from Piper dealers or distributors. Any correspondence regarding the airplane should include the airplane model and serial number to insure proper response.



## 8.5 PREVENTIVE MAINTENANCE

The holder of a Pilot Certificate issued under FAR Part 61 may perform certain preventive maintenance described in FAR Part 43. This maintenance may be performed only on an aircraft which the pilot owns or operates and which is not used in air carrier service. The following is a list of the maintenance which the pilot may perform:

- (a) Repair or change tires and tubes.
- (b) Service landing gear wheel bearings, such as cleaning, greasing or replacing.
- (c) Service landing gear shock struts by adding air, oil or both.
- (d) Replace defective safety wire and cotter keys.
- (e) Lubrication not requiring disassembly other than removal of non-structural items such as cover plates, cowling or fairings.
- (f) Replenish hydraulic fluid in the hydraulic reservoirs.
- (g) Refinish the exterior or interior of the aircraft (excluding balanced control surfaces) when removal or disassembly of any primary structure or operating system is not required.
- (h) Replace side windows and safety belts.
- (i) Replace seats or seat parts with replacement parts approved for the aircraft.
- (j) Replace bulbs, reflectors and lenses of position and landing lights.
- (k) Replace cowling not requiring removal of the propeller.
- (l) Replace, clean or set spark plug clearance.
- (m) Replace any hose connection, except hydraulic connections, with approved replacement hoses.
- (n) Remove the battery and check fluid level and specific gravity.

Although the above work is allowed by law, each individual should make a self analysis as to whether he has the ability to perform the work.

If the above work is accomplished, an entry must be made in the appropriate logbook. The entry should contain:

- (a) The date the work was accomplished.
- (b) Description of the work.
- (c) Number of hours on the aircraft.
- (d) The certificate number of pilot performing the work.
- (e) Signature of the individual doing the work.



### 8.3 AIRPLANE INSPECTION PERIODS

The Federal Aviation Administration (FAA) occasionally publishes Airworthiness Directives (ADs) that apply to specific groups of aircraft. They are mandatory changes and are to be complied with within a time limit set by the FAA. When an AD is issued, it is sent to the latest registered owner of the affected aircraft and also to subscribers of the service. The owner should periodically check with his Piper dealer or A & P mechanic to see whether he has the latest issued AD against his aircraft.

Piper Aircraft Corporation provides for the initial and first 50-hour inspection, at no charge to the owner. The Owner Service Agreement which the owner receives upon delivery of the aircraft should be kept in the aircraft at all times. This identifies him to authorized Piper dealers and entitles the owner to receive service in accordance with the regular service agreement terms. This agreement also entitles the transient owner full warranty by any Piper dealer in the world.

One hundred hour inspections are required by law if the aircraft is used commercially. Otherwise this inspection is left to the discretion of the owner. This inspection is a complete check of the aircraft and its systems, and should be accomplished by a Piper Authorized Service Center or by a qualified aircraft and power plant mechanic who owns or works for a reputable repair shop. The inspection is listed, in detail, in the inspection report of the appropriate Service Manual.

An annual inspection is required once a year to keep the Airworthiness Certificate in effect. It is the same as a 100-hour inspection except that it must be signed by an Inspection Authorized (IA) mechanic or a General Aviation District Office (GADO) representative. This inspection is required whether the aircraft is operated commercially or for pleasure.

A Progressive Maintenance program is approved by the FAA and is available to the owner. It involves routine and detailed inspections at 50-hour intervals. The purpose of the program is to allow maximum utilization of the aircraft, to reduce maintenance inspection cost and to maintain a maximum standard of continuous airworthiness. Complete details are available from Piper dealers.

A spectographic analysis of the oil is available from several sources. This system, if used intelligently, provides a good check of the internal condition of the engine. For this system to be accurate, oil samples must be sent in at regular intervals, and induction air filters must be cleaned or changed regularly.



## 8.9 GROUND HANDLING

### (a) Towing

The airplane may be moved on the ground by the use of the nose wheel steering bar that is stowed in the rear baggage compartment or by power equipment that will not damage or excessively strain the nose gear steering assembly. Towing lugs are incorporated as part of the nose gear fork.

#### CAUTION

When towing with power equipment, do not turn the nose gear beyond its steering radius in either direction, as this will result in damage to the nose gear and steering mechanism.

#### CAUTION

Do not tow the airplane when the controls are secured.

In the event towing lines are necessary, ropes should be attached to both main gear struts as high up on the tubes as possible. Lines should be long enough to clear the nose and/or tail by not less than fifteen feet, and a qualified person should ride in the pilot's seat to maintain control by use of the brakes.

### (b) Taxiing

Before attempting to taxi the airplane, ground personnel should be instructed and approved by a qualified person authorized by the owner. Engine starting and shut-down procedures as well as taxi techniques should be covered. When it is ascertained that the propeller back blast and taxi areas are clear, power should be applied to start the taxi roll, and the following checks should be performed:

- (1) Taxi a few feet forward and apply the brakes to determine their effectiveness.
- (2) Taxi with the propeller set in low pitch, high RPM setting.
- (3) While taxiing, make slight turns to ascertain the effectiveness of the steering.
- (4) Observe wing clearance when taxiing near buildings or other stationary objects. If possible, station an observer outside the airplane.
- (5) When taxiing over uneven ground, avoid holes and ruts.
- (6) Do not operate the engine at high RPM when running up or taxiing over ground containing loose stones, gravel, or any loose material that may cause damage to the propeller blades.



### 8.7 AIRPLANE ALTERATIONS

If the owner desires to have his aircraft modified, he must obtain FAA approval for the alteration. Major alterations accomplished in accordance with Advisory Circular 43.13-2, when performed by an A & P mechanic, may be approved by the local FAA office. Major alterations to the basic airframe or systems not covered by AC 43.13-2 require a Supplemental Type Certificate.

The owner or pilot is required to ascertain that the following Aircraft Papers are in order and in the aircraft.

- (a) To be displayed in the aircraft at all times:
  - (1) Aircraft Airworthiness Certificate Form FAA-8100-2.
  - (2) Aircraft Registration Certificate Form FAA-8050-3.
  - (3) Aircraft Radio Station License if transmitters are installed.
- (b) To be carried in the aircraft at all times:
  - (1) Pilot's Operating Handbook.
  - (2) Weight and Balance data plus a copy of the latest Repair and Alteration Form FAA-337, if applicable.
  - (3) Aircraft equipment list.

Although the aircraft and engine logbooks are not required to be in the aircraft, they should be made available upon request. Logbooks should be complete and up to date. Good records will reduce maintenance cost by giving the mechanic information about what has or has not been accomplished.



### 8.11 ENGINE AIR FILTER

(a) Removing Engine Air Filter

- (1) Remove the access door on left side of lower cowl.
- (2) Remove the wing nuts securing the filter. Remove the filter.

(b) Cleaning Engine Air Filter

The injector air filter must be cleaned at least once every 50 hours, and more often, even daily, when operating in dusty conditions. Extra filters are inexpensive, and a spare should be kept on hand for use as a rapid replacement.

To clean the filter:

- (1) Tap the filter gently to remove dirt particles, being careful not to damage the filter. DO NOT wash the filter in any liquid. DO NOT attempt to blow out dirt with compressed air.
- (2) If the filter is excessively dirty or shows any damage, replace it immediately.
- (3) Wipe the filter housing with a clean cloth soaked in unleaded gasoline. When the housing is clean and dry, install the filter.

(c) Installation Of Engine Air Filter

After cleaning or when replacing the filter, install the filter in the reverse order of removal.

### 8.13 BRAKE SERVICE

The brake system is filled with MIL-H-5606 (petroleum base) hydraulic brake fluid. The fluid level should be checked periodically or at every 100 hour inspection and replenished when necessary. The brake reservoir is located on the left side of the fire wall in the engine compartment. If the entire system must be refilled, fill with fluid under pressure from the brake end of the system. This will eliminate air from the system.

No adjustment of the brake clearances is necessary. If after extended service brake blocks become excessively worn, they should be replaced with new segments.



(c) Parking

When parking the airplane, be sure that it is sufficiently protected from adverse weather conditions and that it presents no danger to other aircraft. When parking the airplane for any length of time or overnight, it is suggested that it be moored securely.

- (1) To park the airplane, head it into the wind if possible.
- (2) Set the parking brake by pulling back on the brake lever and depressing the knob on the handle. To release the parking brake, pull back on the handle until the catch disengages; then allow the handle to swing forward.

**CAUTION**

Care should be taken when setting brakes that are overheated or during cold weather when accumulated moisture may freeze a brake.

- (3) Aileron and stabilator controls should be secured with the front seat belt and chocks used to properly block the wheels.

(d) Mooring

The airplane should be moored for immovability, security and protection. The following procedures should be used for the proper mooring of the airplane:

- (1) Head the airplane into the wind if possible.
- (2) Retract the flaps.
- (3) Immobilize the ailerons and stabilator by looping the seat belt through the control wheel and pulling it snug.
- (4) Block the wheels.
- (5) Secure tie-down ropes to the wing tie-down rings and to the tail skid at approximately 45 degree angles to the ground. When using rope of non-synthetic material, leave sufficient slack to avoid damage to the airplane should the ropes contract.

**CAUTION**

Use bowline knots, square knots or locked slip knots. Do not use plain slip knots.

**NOTE**

Additional preparations for high winds include using tie-down ropes from the landing gear forks and securing the rudder.

- (6) Install a pitot head cover if available. Be sure to remove the pitot head cover before flight.
- (7) Cabin and baggage doors should be locked when the airplane is unattended.



### 8.15 LANDING GEAR SERVICE

The landing gears use Cleveland Aircraft Products 6.00 x 6 wheels. All three tires are 6.00 x 6 tube type. The main gear tires are 6 ply rating and the nose gear tire is 4 or 6 ply rating. (See Section 8.23.)

Main wheels are removed by taking off the hub cap, axle nut, and the two bolts holding the brake segment in place, after which the wheel slips easily from the axle.

The nose wheel is removed by taking off the axle nut and washer from one side, sliding out the axle rod and plugs, lightly tapping out the axle tube, and then removing the wheel and spacer tubes from between the fork. Wheels are replaced by reversing the procedure.

Tires are removed from the wheels by deflating the tire, removing the through bolts, and separating the wheel halves.

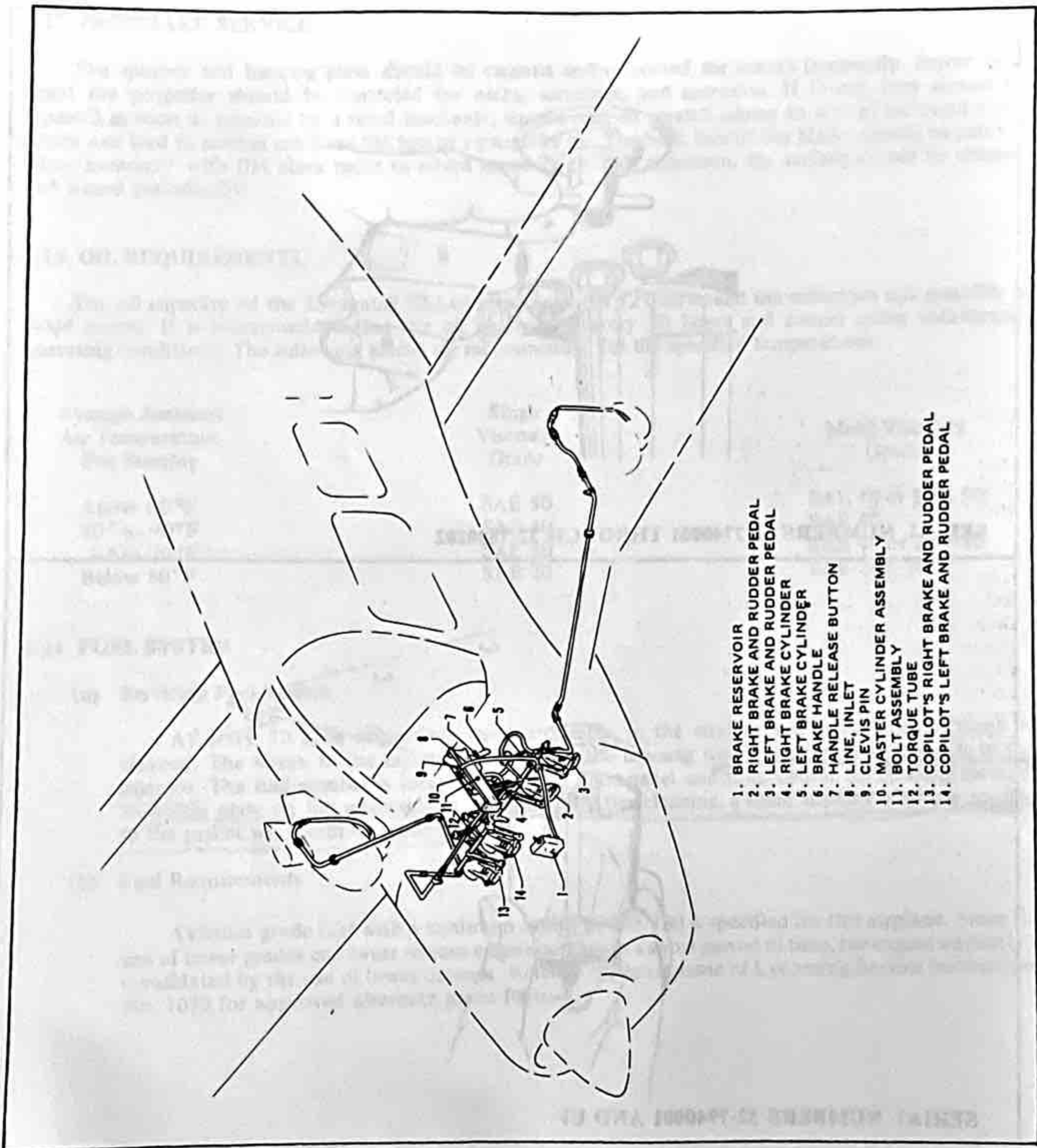
Landing gear oleo struts should be checked for proper strut exposure and visible leaks. The required extensions for the struts under normal static load (empty weight of airplane plus full fuel and oil) are 3-1/4 inches for the nose gear and 4-1/2 inches for the main gear. If the strut exposure is below that required, it should be determined whether air or oil is needed by first raising the airplane on jacks. Depress the valve core to allow air to escape from the strut housing chamber. Remove the filler plug and slowly raise the strut to full compression. If the fluid is then visible up to the bottom of the filler plug hole, only proper inflation with air is required.

If fluid is below the bottom of the filler plug hole, oil should be added. Replace the plug with the valve core removed. Then attach a clear plastic hose to the valve stem of the filler plug and submerge the free end in a container of hydraulic fluid (MIL-H-5606). Fully compress and extend the strut several times, thus drawing fluid into the strut chamber and expelling air. To allow fluid to enter the bottom chamber of the nose gear strut housing, it is necessary to disconnect the torque link assembly and allow the strut to extend a full 10 inches. (The nose gear torque links need not be disconnected.) DO NOT allow the strut to extend beyond 12 inches. When air bubbles cease to flow through the hose, fully compress the strut, remove the filler plug, and again check the fluid level. When the fluid level is correct, disconnect the hose, reinstall the valve core, the filler plug, and the main gear torque links.

With the fluid in the strut housing at the proper level, attach a strut pump to the air valve. With the airplane on the ground under normal static load, inflate the oleo strut to the proper strut exposure.

In jacking the airplane for landing gear or other service, two hydraulic jacks and a tail stand should be used. At least 350 pounds of ballast should be placed on the base of the tail stand before jacking up the airplane. The hydraulic jacks are placed under the jack points on the underside of the wings, and the airplane is jacked up until the tail stand can be attached to the tail skid. After attaching the tail stand and adding ballast, the jacking can be continued until the airplane is at the desired height.

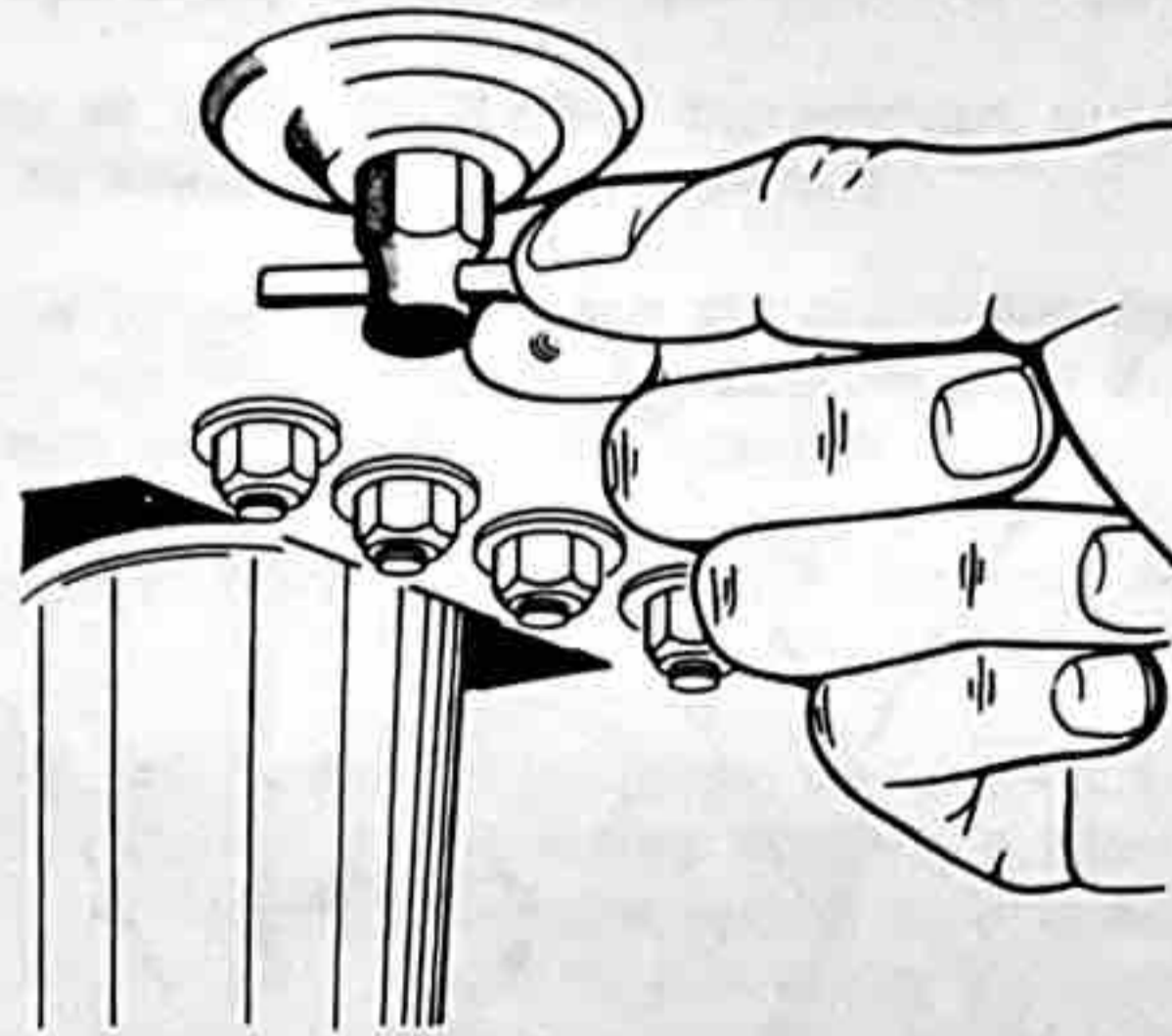




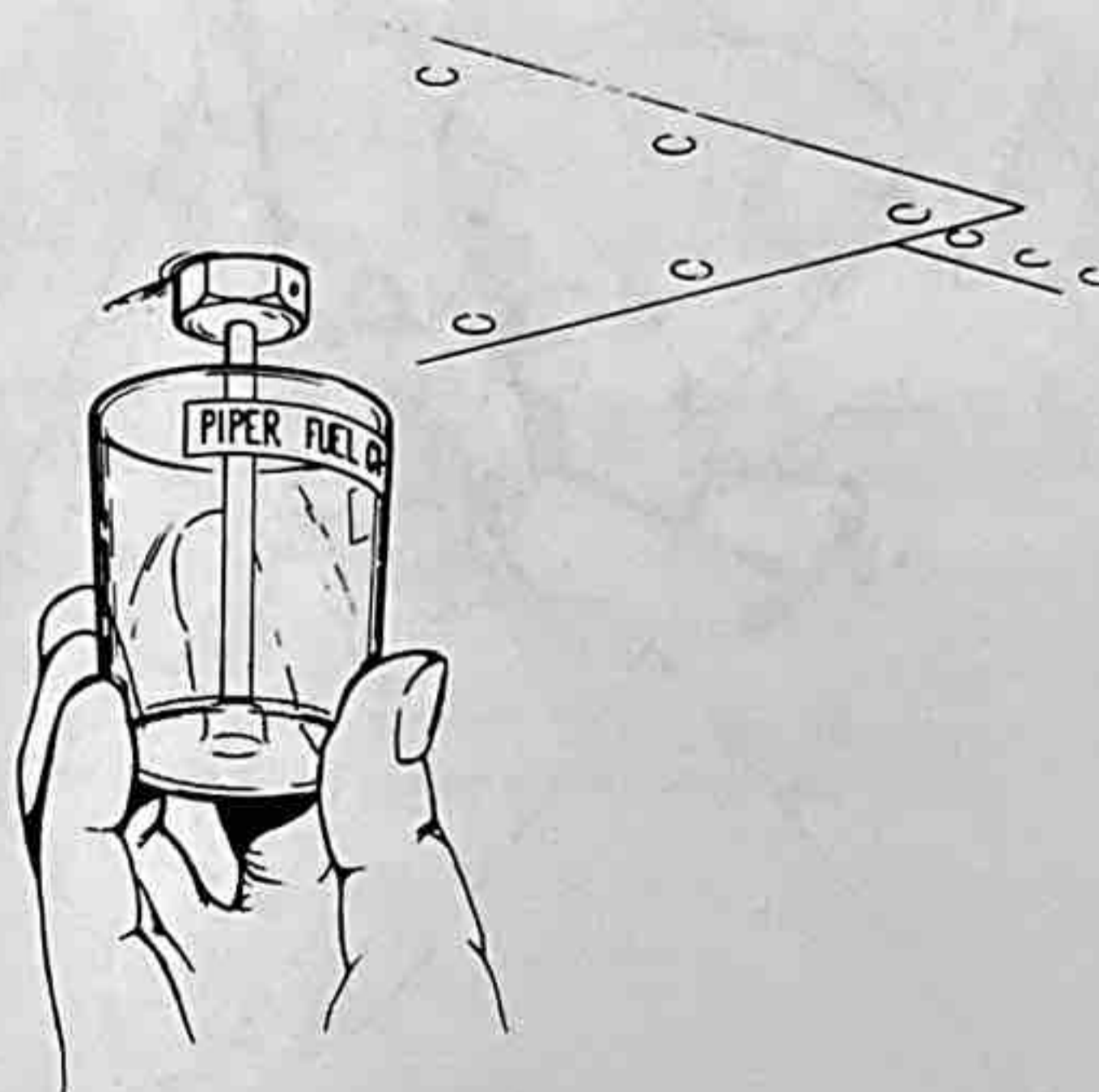
**BRAKE SYSTEM**

Figure 8-1





SERIAL NUMBERS 32-7740001 THROUGH 32-7840202



SERIAL NUMBERS 32-7940001 AND UP

FUEL DRAIN

Figure 8-3



### 8.17 PROPELLER SERVICE

The spinner and backing plate should be cleaned and inspected for cracks frequently. Before each flight the propeller should be inspected for nicks, scratches, and corrosion. If found, they should be repaired as soon as possible by a rated mechanic, since a nick or scratch causes an area of increased stress which can lead to serious cracks or the loss of a propeller tip. The back face of the blades should be painted when necessary with flat black paint to retard glare. To prevent corrosion, the surface should be cleaned and waxed periodically.

### 8.19 OIL REQUIREMENTS

The oil capacity of the Lycoming IO-540 series engine is 12 quarts, and the minimum safe quantity is 2-3/4 quarts. It is recommended that the oil be changed every 50 hours and sooner under unfavorable operating conditions. The following grades are recommended for the specified temperatures:

Average Ambient Air Temperature For Starting	Single Viscosity Grade	Multi-Viscosity Grades
Above 60°F	SAE 50	SAE 40 or SAE 50
30° to 90°F	SAE 40	SAE 40
0° to 70°F	SAE 30	SAE 40 or 20W-30
Below 10°F	SAE 20	SAE 20W-30

### 8.21 FUEL SYSTEM

#### (a) Servicing Fuel System

At every 50 hour inspection, the fuel screens in the strainer and in the injector must be cleaned. The screen in the injector is located in the housing where the fuel line connects to the injector. The fuel strainer is located under the floor panel and is accessible for cleaning through an access plate on the underside of the fuselage. After cleaning, a small amount of grease applied to the gasket will facilitate reassembly.

#### (b) Fuel Requirements

Aviation grade fuel with a minimum octane of 100/130 is specified for this airplane. Since the use of lower grades can cause serious engine damage in a short period of time, the engine warranty is invalidated by the use of lower octanes. Refer to the latest issue of Lycoming Service Instructions No. 1070 for approved alternate grade fuels.



(e) Draining Fuel System

156

Serial Numbers 32-7740001 through 32-7840202:

The bulk of the fuel may be drained by opening the individual drain on each tank. The remaining fuel may be drained through the fuel strainer. Any individual tank may be drained by closing the fuel selector valve and then draining the desired tank.

Serial Numbers 32-7940001 and up:

The bulk of the fuel may be drained by opening the individual drain on each tank. The remaining fuel may be drained through the fuel strainer.



(c) Filling Fuel Tanks

Serial Numbers 32-7740001 through 32-7840202:

Observe all safety precautions required when handling gasoline. Fill the fuel tanks through the filler located on the forward slope of the wings and on the wing tips. Each wing tank holds a maximum of 25 U.S. gallons, and each wing tip tank holds a maximum of 17 U.S. gallons. When using less than the standard 84 gallon capacity, fuel should be distributed equally between each side, with the wing tip tanks filled first.

Serial Numbers 32-7940001 and up:

Observe all safety precautions required when handling gasoline. Fill the fuel tanks through the filler located on the forward slope of the wings. Each wing holds a maximum of 49 U. S. gallons. When using less than standard 98 gallon capacity, fuel should be distributed equally between each side.

(d) Draining Fuel Strainer, Sumps and Lines

The fuel tank sumps and strainer should be drained before the first flight of the day and after refueling to avoid the accumulation of water and sediment. Each fuel tank has an individual quick drain at the lower inboard corner. A fuel strainer with a fuel system quick drain is located at the lowest point in the system. Each tank sump should be drained through its individual quick drain until sufficient fuel has flowed to ensure the removal of any contaminants. The fuel strainer sump quick drain, operated by a lever inside the cabin on the right forward edge of the wing spar housing, should be opened while the fuel selector valve is moved through the tank positions. (Four tank positions on serial numbers 32-7740001 through 32-7840202 and two tank positions on serial numbers 32-7940001 and up). Enough fuel should flow at each position to allow the fuel lines and the strainer to ensure removal of contaminants. A container is provided for the checking of fuel clarity. (See Description - Airplane and Systems Section for more detailed instructions.)

**CAUTION**

When draining fuel, be sure that no fire hazard exists before starting the engine.

After using the fuel system quick drain, check from outside the airplane to be sure that it has closed completely and is not leaking.



(b) Cleaning Landing Gear

Before cleaning the landing gear, place a plastic cover or similar material over the wheel and brake assembly.

- (1) Place a pan under the gear to catch waste.
- (2) Spray or brush the gear area with solvent or a mixture of solvent and degreaser, as desired. Where heavy grease and dirt deposits have collected, it may be necessary to brush areas that were sprayed, in order to clean them.
- (3) Allow the solvent to remain on the gear from five to ten minutes. Then rinse the gear with additional solvent and allow to dry.
- (4) Remove the cover from the wheel and remove the catch pan.
- (5) Lubricate the gear in accordance with the Lubrication Chart in the PA-32 Service Manual.

(c) Cleaning Exterior Surfaces

The airplane should be washed with a mild soap and water. Harsh abrasives or alkaline soaps or detergents could make scratches on painted or plastic surfaces or could cause corrosion of metal. Cover areas where cleaning solution could cause damage. To wash the airplane, use the following procedure:

- (1) Flush away loose dirt with water.
- (2) Apply cleaning solution with a soft cloth, a sponge or a soft bristle brush.
- (3) To remove exhaust stains, allow the solution to remain on the surface longer.
- (4) To remove stubborn oil and grease, use a cloth dampened with naphtha.
- (5) Rinse all surfaces thoroughly.
- (6) Any good automotive wax may be used to preserve painted surfaces. Soft cleaning cloths or a chamois should be used to prevent scratches when cleaning or polishing. A heavier coating of wax on the leading surfaces will reduce the abrasion problems in these areas.

(d) Cleaning Windshield and Windows

- (1) Remove dirt, mud and other loose particles from exterior surfaces with clean water.
- (2) Wash with mild soap and warm water or with aircraft plastic cleaner. Use a soft cloth or sponge in a straight back and forth motion. Do not rub harshly.
- (3) Remove oil and grease with a cloth moistened with kerosene.

**CAUTION**

Do not use gasoline, alcohol, benzene, carbon tetrachloride, thinner, acetone, or window cleaning sprays.



### 8.23 TIRE INFLATION

For maximum service from the tires, keep them inflated to the proper pressures – 28-30 psi for the nose gear and 35-40 psi for the main gear. All wheels and tires are balanced before original installation, and the relationship of tire, tube, and wheel should be maintained upon reinstallation. Unbalanced wheels can cause extreme vibration in the landing gear; therefore, in the installation of new components, it may be necessary to rebalance the wheels with the tires mounted. When checking tire pressure, examine the tires for wear, cuts, bruises, and slippage.

### 8.25 BATTERY SERVICE

Access to the 12-volt battery is through a removable panel in the floor of the forward baggage compartment. The battery box has a plastic tube which is normally closed off with a cap and which should be opened occasionally to drain off any accumulation of liquid. The battery should be checked for proper fluid level. DO NOT fill the battery above the baffle plates. DO NOT fill the battery with acid - use water only. A hydrometer check will determine the percent of charge in the battery.

If the battery is not up to charge, recharge starting at a 4 amp rate and finishing with a 2 amp rate. Quick charges are not recommended.

### 8.27 CLEANING

#### (a) Cleaning Engine Compartment

Before cleaning the engine compartment, place a strip of tape on the magneto vents to prevent any solvent from entering these units.

- (1) Place a large pan under the engine to catch waste.
- (2) With the engine cowling removed, spray or brush the engine with solvent or a mixture of solvent and degreaser. In order to remove especially heavy dirt and grease deposits, it may be necessary to brush areas that were sprayed.

#### CAUTION

Do not spray solvent into the alternator, vacuum pump, starter, or air intakes.

- (3) Allow the solvent to remain on the engine from five to ten minutes. Then rinse the engine clean with additional solvent and allow it to dry.

#### CAUTION

Do not operate the engine until excess solvent has evaporated or otherwise been removed.

- (4) Remove the protective tape from the magnetos.
- (5) Lubricate the controls, bearing surfaces, etc., in accordance with the Lubrication Chart in the PA-32 Service Manual.



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- (4) After cleaning plastic surfaces, apply a thin coat of hard polishing wax. Rub lightly with a soft cloth. Do not use a circular motion.
- (5) A severe scratch or mar in plastic can be removed by rubbing out the scratch with jeweler's rouge. Smooth both sides and apply wax.

(e) Cleaning Headliner, Side Panels and Seats

- (1) Clean headliner, side panels, and seats with a stiff bristle brush, and vacuum where necessary.
- (2) Soiled upholstery, except leather, may be cleaned with a good upholstery cleaner suitable for the material. Carefully follow the manufacturer's instructions. Avoid soaking or harsh rubbing.

CAUTION

Solvent cleaners require adequate ventilation.

- (3) Leather should be cleaned with saddle soap or a mild hand soap and water.

(f) Cleaning Carpets

To clean carpets, first remove loose dirt with a whisk broom or vacuum. For soiled spots and stubborn stains use a noninflammable dry cleaning fluid. Floor carpets may be cleaned like any household carpet.



TABLE OF CONTENTS  
SECTION 9  
SUPPLEMENTS

Paragraph/Supplement No.	Page No.
9.1 General .....	9-1
1 Air Conditioning System Installation .....	9-3
2 AutoFlite II Autopilot Installation .....	9-7
3 AutoControl IIIB Autopilot Installation .....	9-9
4 AltiMatic IIIC Autopilot Installation (Ser. nos. 32-7740001 through 32-7840202) .....	9-13
5 AltiMatic IIIC Autopilot Installation (Ser. nos. 32-7940001 and up) .....	9-21
6 Piper Electric Pitch Trim .....	9-29



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PIPER AIRCRAFT CORPORATION  
PA-32-300, CHEROKEE SIX

SECTION 9  
SUPPLEMENTS

9.1 GENERAL

This section provides information in the form of Supplements which are necessary for efficient operation of the airplane when equipped with one or more of the various optional systems and equipment not provided with the standard airplane.

All of the Supplements provided by this section are "FAA Approved" and consecutively numbered as a permanent part of this Handbook. The information contained in each Supplement applies only when the related equipment is installed in the airplane.

- (1) To ensure maximum climb performance, the air conditioner must be turned "OFF" manually prior to takeoff to discharge the compressor and extend the condenser coils. After the air conditioner must be turned "OFF" manually before the landing approach in preparation for a possible go-around.
- (2) Caution: In full view of the pilot, in the area of the air conditioner controls when the air conditioner is installed.

WARNING - AIR CONDITIONER MUST BE OFF TO ENSURE NORMAL TAKEOFF CLIMB PERFORMANCE.

In full view of the pilot, to the right of the engine master caution door light.

AIR COND OFF  
OPEN

SECTION 3 - EMERGENCY PROCEDURES

No changes to the basic Emergency Procedures provided by Section 3 of this Pilot's Operating Handbook are necessary for this supplement.



SUPPLEMENT 1

AIR CONDITIONING INSTALLATION

SECTION 1 - GENERAL

This supplement supplies information necessary for the efficient operation of the airplane when the optional Air Conditioning system is installed. The information contained within this supplement is to be used in conjunction with the complete handbook.

This supplement has been "FAA Approved" as a permanent part of this handbook and must remain in this handbook at all times when the optional air conditioning system is installed.

SECTION 2 - LIMITATIONS

- (a) To insure maximum climb performance the air conditioner must be turned "OFF" manually prior to takeoff to disengage the compressor and retract the condenser door. Also the air conditioner must be turned "OFF" manually before the landing approach in preparation for a possible go-around.
- (b) Placards  
In full view of the pilot, in the area of the air conditioner controls when the air conditioner is installed:

"WARNING - AIR CONDITIONER MUST BE OFF TO INSURE  
NORMAL TAKEOFF CLIMB PERFORMANCE."

In full view of the pilot, to the right of the engine gauges (condenser door light):

"AIR COND DOOR  
OPEN"

SECTION 3 - EMERGENCY PROCEDURES

No changes to the basic Emergency Procedures provided by Section 3 of this Pilot's Operating Handbook are necessary for this supplement.



PIPER AIRCRAFT CORPORATION  
PA-32-300, CHEROKEE SIX

The climb performance is not compromised measurably with the air conditioner operating since the compressor is declutched and the condenser door is retracted, both automatically, when a full throttle position is selected. When the full throttle position is not used or in the event of a malfunction which would cause the compressor to operate and the condenser door to be extended, a decrease in rate of climb of as much as 100 fpm can be expected. Should a malfunction occur which prevents condenser door retraction when the compressor is turned off, a decrease in rate of climb of as much as 50 fpm can be expected.

Amended Supplement Information necessary for the operation of the airplane with the air conditioner is included. For information, standard values for engine, airspeed, and rate of climb are given.

This supplement has been "PA-C Supplement" and contains partial airspeed and rate of climb data for the airplane with the air conditioner installed.

SECTION 1 - LIMITATIONS

- (1) Airspeed limits are provided for the climb, cruise, and descent.
- (2) Airspeed limit is "V<sub>NE</sub>" for takeoff and landing.
- (3) Airspeed limit is provided for maximum configuration.

SECTION 2 - EMERGENCY PROCEDURES

- (1) In case of stall warning, CRUISE (maximum) airspeed is limited to 100 KIAS.
- (2) Master switch is disengaged when "OFF".
- (3) Fuel may be uncontrolled shutdown.
- (4) In case of engine failure, 2 seconds delay occurs in 10" bank and 10" pitch before master switch is disengaged.
- (5) In case of engine failure, 2 seconds delay occurs in 10" bank and 10" pitch before master switch is disengaged.

SECTION 4 - NORMAL PROCEDURES

APPENDIX B - FLIGHT INSTRUCTIONS

- (1) Airspeed limits are provided for climb, cruise, and descent.
- (2) Before takeoff, ensure that the master switch is disengaged and the engine is running.
- (3) With the master switch disengaged, the engine will stop if the master switch is turned off.
- (4) Airspeed limits are provided for climb, cruise, and descent.



SUPPLEMENT 2

AUTOFLITE II AUTOPILOT INSTALLATION

SECTION 1 - GENERAL

This supplement supplies information necessary for the operation of the airplane when the optional AutoFlite II Autopilot is installed. The information contained within this supplement is to be used in conjunction with the complete handbook.

This supplement has been "FAA Approved" as a permanent part of this handbook and must remain in this handbook at all times when the optional AutoFlite II Autopilot is installed.

SECTION 2 - LIMITATIONS

- (a) Autopilot operation prohibited above 175 KIAS. (Autopilot Vmo)
- (b) Autopilot must be "OFF" for takeoff and landing.
- (c) Autopilot use prohibited in seaplane configuration.

SECTION 3 - EMERGENCY PROCEDURES

- (a) In case of malfunction, PRESS disconnect switch on pilot's control wheel.
- (b) Rocker switch on instrument panel - OFF.
- (c) Unit may be overpowered manually.
- (d) In cruise configuration malfunction, 3 seconds delay results in 35° bank and 50 ft altitude loss.
- (e) In approach configuration malfunction, 1 second delay results in 10° bank and 50 ft altitude loss.

SECTION 4 - NORMAL PROCEDURES

AUTOFLITE II PREFLIGHT INSPECTION

- (a) AutoFlite master switch - ON.
- (b) Rotate Turn Command Knob to left and right. Aircraft control wheels should rotate in corresponding directions.
- (c) With AutoFlite II on, rotate aircraft control wheel to left and right. Only light forces should be required to override roll servo clutch.
- (d) AutoFlite II master switch - OFF - rotate control wheel left and right to assure disengagement.



**AUTOFLITE II IN-FLIGHT PROCEDURE**

- (a) Engagement
  - (1) Check Turn Command Knob in center detent position.
  - (2) AutoFlite II master switch - ON.
- (b) Disengagement
  - (1) AutoFlite II master switch - OFF.
- (c) Heading Changes
  - (1) Move Trim Knob on instrument for Drift Correction from a Constant Heading.
  - (2) Move Turn Command Knob for left or right banked turns. Rotation of knob to stop will yield an appropriate bank angle to obtain an appropriate standard rate turn. Intermediate settings may be used for lesser turn rates.
- (d) OMNI Tracker
  - (1) Turn Command Knob - move to center detent position and push IN to engage tracker. Aircraft will track desired radial established on NAV 1 (or as selected, if equipped with a NAV Selector Switch).

Tracker must be engaged within 10° of being "on course," i.e. VOR course needle centered and aircraft heading within a 10° of VOR course.

- (2) Trim Knob - push IN for high sensitivity. Use high sensitivity position for Localizer tracking and as desired for OMNI tracking.
- (e) Maintain directional trim during all autopilot operations.

**SECTION 5 - PERFORMANCE**

No changes to the basic performance provided by Section 5 of this Pilot's Operating Handbook are necessary for this supplement.



SUPPLEMENT 3

AUTOCONTROL IIIB AUTOPILOT INSTALLATION

SECTION 1 - GENERAL

This supplement supplies information necessary for the operation of the airplane when the optional Piper AutoControl IIIB Autopilot is installed. The information contained within this supplement is to be used in conjunction with the complete handbook.

This supplement has been "FAA Approved" as a permanent part of this handbook and must remain in this handbook at all times when the optional Piper AutoControl IIIB Autopilot is installed.

SECTION 2 - LIMITATIONS

- (a) Autopilot operation prohibited above 160 KIAS. (Autopilot Vmo)
- (b) Autopilot must be "OFF" for takeoff and landing.

SECTION 3 - EMERGENCY PROCEDURES

- (a) In an emergency the AutoControl IIIB can be disconnected by:
  - (1) Pushing the roll ON-OFF Rocker Switch "OFF."
  - (2) Pulling the Autopilot Circuit Breaker.
- (b) The autopilot can be overpowered at either control wheel.
- (c) An Autopilot runaway, with a 3 second delay in the initiation of recovery, while operating in a climb, cruise or descending flight could result in a 38° bank and 40 ft altitude loss.
- (d) An Autopilot runaway, with a 1 second delay in the initiation of recovery, during an approach operation, coupled or uncoupled, could result in an 8° bank and 10 ft altitude loss.

SECTION 4 - NORMAL PROCEDURES

PREFLIGHT INSPECTION - AUTOPILOT

- (a) Roll Section
  - (1) Place Radio Coupler in "Heading" mode and place A/P ON/OFF switch in the "ON" position to engage roll section. Rotate roll command knob Left and Right and observe control wheel describes a corresponding Left and Right turn, then center knob.
  - (2) Set proper D.G. Heading on D.G. and turn Heading Indice to aircraft heading. Engage "Heading" mode switch and rotate Heading Indice right and left. Aircraft control wheel should turn same direction as Indice. While D.G. indice is set for a left turn, grasp control wheel and override the servo to the right. Repeat in opposite direction for right turn.



- (3) If VOR signal available check Omni mode on Radio Coupler by swinging Omni needle left and right slowly. Observe that control wheel rotates in direction of needle movement.
- (4) Disengage by placing the A/P ON/OFF switch to the "OFF" position.

### IN-FLIGHT

- (a) Trim airplane (ball centered).
- (b) Check air pressure vacuum to ascertain that the directional gyro and attitude gyro are receiving sufficient air.
- (c) Roll Section
  - (1) To engage, center Roll knob, push AP "ON-OFF" switch to "ON" position. To turn, rotate console ROLL knob in desired direction. (Maximum angle of bank should not exceed 30°.)
  - (2) For heading mode, set directional gyro with magnetic compass. Push directional gyro HDG knob in, rotate bug to aircraft heading. Push console heading rocker (HDG) switch to "ON" position. To select a new aircraft heading, push D.G. heading knob "IN" and rotate, in desired direction of turn, to the desired heading.

#### NOTE

In HDG mode the maximum bank angles are limited to approximately 20° and single command, heading changes should be limited to 150°. (HDG Indice not more than 150° from actual aircraft heading.)

- (d) VOR
  - (1) To Intercept:
    - a. Using OMNI Bearing Selector, dial desired course, inbound or outbound.
    - b. Set identical heading on Course Selector D.G.
    - c. After aircraft has stabilized, position coupler mode selector knob to OMNI mode. As aircraft nears selected radial, interception and crosswind correction will be automatically accomplished without further switching.

#### NOTE

If aircraft position is less than 45° from selected radial, aircraft will intercept before station. If position is more than 45°, interception will occur after station passage. As the aircraft nears the OMNI station, (1/2 mile) the zone of confusion will direct an "S" turn in alternate directions as the OMNI indicator needle swings. This alternate banking limited to the standard D.G. bank angle, is an indication of station passage.



- (2) To select new course:
  - a. To select a new course or radial, rotate the HDG indice to the desired HDG (match course).
  - b. Rotate OBS to the new course. Aircraft will automatically turn to the intercept heading for the new course.
- (3) To change stations:
  - a. If same course is desired, merely tune receiver to new station frequency.
  - b. If different course is desired, position coupler mode selector to HDG mode. Dial course selector D.G. to new course. Dial OBS to new course and position coupler mode selector to OMNI mode.
- (e) VOR Approach

Track inbound to station as described in VOR navigation section. After station passage:

  - (1) Dial outbound course on Course Selector D.G., then dial same course on OBS.
  - (2) After established on outbound radial, position coupler mode selector to HDG mode and select outbound procedure turn heading. After 40 seconds to 1 minute select a turn in the desired direction with the Course Selector D.G. to the inbound procedure turn heading.
  - (3) Set OBS to inbound course.
  - (4) When aircraft heading is  $45^\circ$  to the inbound course, dial Course Selector D.G. to inbound course and position coupler mode selector to OMNI mode.

NOTE

For precise tracking over OMNI station, without "S" turn, position coupler mode selector to HDG mode just prior to station passage. If holding pattern is desired, position coupler mode selector to HDG mode at station passage inbound and select outbound heading in direction of turn. After elapsed time, dial inbound course on Course Selector D.G. When aircraft heading is  $45^\circ$  to radial, position coupler mode selector to OMNI mode.

- (f) LOC Approach Only
  - (1) To intercept dial ILS outbound course on Course Selector D.G. When stabilized, position coupler mode selector to LOC REV mode.
  - (2) After interception and when beyond outer marker, position coupler mode selector to HDG mode and dial outbound procedure turn heading. After one minute, dial inbound procedure turn heading in direction of turn.
  - (3) When aircraft heading is  $45^\circ$  to ILS inbound course dial inbound course on Course Selector D.G. and position coupler mode selector to LOC NORM mode.
  - (4) At the missed approach point (M.A.P.), or when missed approach is elected, position coupler mode selector to HDG mode and execute missed approach procedure.



(g) LOC Approach - Back Course (Reverse)

- (1) To intercept dial ILS Back Course outbound heading on Course Selector D.G. When stabilized, position coupler mode selector to LOC NORM mode.
- (2) After interception and when beyond fix, position coupler mode selector to HDG and dial outbound procedure turn heading. After one minute, dial inbound procedure turn heading in direction of turn.
- (3) When heading 45° to inbound course, dial inbound course on Course Selector D.G. and position coupler mode selector to LOC REV mode.
- (4) Approximately 1/2 mile from runway, position coupler mode selector to HDG mode to prevent "S" turn over ILS station near runway threshold.
- (5) Missed approach - same as Front Course. See (b) (4).

SECTION 5 - PERFORMANCE

No changes to the basic performance provided by Section 5 of the Pilot's Operating Handbook are necessary for this supplement.



SUPPLEMENT 4

ALTIMATIC IIC AUTOPILOT INSTALLATION  
(SERIAL NUMBERS 32-7740001 THROUGH 32-7840202)

SECTION 1 - GENERAL

This supplement supplies information necessary for the operation of the airplane when the optional AltiMatic IIC Autopilot is installed in accordance with STC SA3011SW. The information contained within this supplement is to be used "as described" in conjunction with the complete handbook.

This supplement has been "FAA Approved" as a permanent part of this handbook and must remain in this handbook at all times when the optional AltiMatic IIC Autopilot is installed.

SECTION 2 - LIMITATIONS

- (a) Autopilot operation prohibited above 175 KIAS. (Autopilot Vmo)
- (b) Autopilot must be "OFF" during takeoff and landing.
- (c) Required placard P/N 13A660-1 "Conduct Trim Check prior to flight (see P/O/H)" to be installed in clear view of pilot.

SECTION 3 - EMERGENCY PROCEDURES

This aircraft is equipped with a Master Disconnect/Interrupt Switch on the pilot's control wheel. When the switch button is depressed it will disconnect the autopilot. When depressed and held it will interrupt all Electric Elevator Trim Operations. Trim operations will be restored when the switch is released. If an autopilot or trim emergency is encountered, do not attempt to determine which system is at fault. Immediately depress and hold the Master Disconnect/Interrupt button. Turn off autopilot and trim master switch and retrim aircraft, then release the interrupt switch.

NOTE

During examination of this supplement, the pilot is advised to locate and identify the autopilot controls, the trim master switch and circuit breakers for both systems.



- (a) In the event of an autopilot malfunction the autopilot can be:
- (1) Overpowered at either control wheel.

**CAUTION**

Do not overpower autopilot pitch axis for periods longer than 3 seconds because the autotrim system will operate in a direction to oppose the pilot and will, thereby, cause an increase in the pitch overpower forces.

- (2) Disconnected by depressing the Master Disconnect/Interrupt Switch.
  - (3) Disconnected by depressing the Trim Switch "AP OFF" bar.
  - (4) Disconnected by pushing the roll rocker switch "OFF."
- (b) In the event of a trim malfunction:
- (1) Depress and hold the Master Trim Interrupt Switch.
  - (2) Trim Master Switch - "OFF." Retrim aircraft as necessary using manual trim system. \*
  - (3) Release Master Interrupt Switch - be alert for possible trim action.
  - (4) Trim Circuit Breaker - Pull. Do not operate trim until problem is corrected.
- (c) If a trim runaway occurs with the autopilot operating, the above procedure will disconnect the autopilot which will immediately result in higher control wheel forces. Be prepared to manually retrim, as necessary to eliminate undesirable forces.
- (d) Altitude Loss During Malfunction:
- (1) An autopilot malfunction during climb, cruise or descent with a 3 second delay in recovery initiation could result in as much as 35° of bank and a 400 ft altitude loss.
  - (2) An autopilot malfunction during an approach with a 1 second delay in recovery initiation could result in as much as 20° of bank and a 180 ft altitude loss. Maximum altitude loss measured in approach configuration and operating either coupled or uncoupled.

**EMERGENCY OPERATION WITH OPTIONAL HSI  
(Non-Slaved)**

- (a) Appearance of HDG Flag:
- (1) Check air supply gauge (vac or pressure) for adequate air supply (4 in. Hg min.).
  - (2) Check NSD 360 circuit breaker.
  - (3) Observe display for proper operation.

Note: If heading card is not operational, autopilot should not be used.

- (b) With card inoperative - VOR and Glide Slope displays are still functional; use card set to rotate card to aircraft heading for correct picture.
- (c) Localizer - left-right information still usable. Flag information is disabled - compare needle with \* 2 indicator for valid left-right needle operation.



SECTION 4 - NORMAL PROCEDURES

PREFLIGHT INSPECTION - AUTOPILOT

- (a) Roll Section
- (1) Place Radio Coupler in "Heading" mode and place roll rocker switch "ON" to engage roll section. Rotate roll command knob left and right and observe that control wheel describes a corresponding left and right turn, then center knob.
  - (2) Set proper D.G. Heading on D.G. and turn Heading Bug to aircraft heading. Engage "Heading" mode rocker switch and rotate heading bug right and left. Aircraft control wheel should turn same direction as bug. Grasp control wheel and manually override servo, both directions.
  - (3) Disengage autopilot by depressing trim switch. Check aileron operation is free and autopilot is disconnected from controls.
- (b) Pitch Section
- (1) Engage "Roll" rocker switch.
  - (2) Center pitch command disc and engage "Pitch" rocker switch.
  - (3) Rotate pitch command disc up and then down and check control yoke moves same direction. Check to see that servo can be overridden by hand at control wheel.

NOTE

Autopilot might not be able to raise elevators, on ground, without assistance from pilot.

- (4) Hold control yoke and disengage autopilot by pressing Master Autopilot Disconnect/Trim Interrupt Switch button. Check Roll and Pitch controls to assure autopilot has disconnected.

General

This aircraft is equipped with a Command Trim System designed to withstand any type of single malfunction, either mechanical or electrical, without uncontrolled operation resulting. The preflight check procedure is designed to uncover hidden failures that might otherwise go undetected. Proper operation of the electric elevator trim system is predicated on conducting the following preflight check before each flight. If the trim system fails any portion of the procedure, pull the trim circuit breaker out until trim system is repaired. Substitution of any trim system component for another model is not authorized. For emergency interrupt information, refer to Section 3 of this Supplement.

Command Electric Trim Switch

The Command Electric Trim Switch on the left hand portion of the pilot's control wheel has two functions:

- (1) When the top bar (AP OFF) is pressed, it disconnects the Autopilot.
- (2) When the top bar is pressed AND the rocker is moved forward, nose down trim will occur, when moved aft, nose up trim will occur.



- (c) Pre-Flight: Command Trim - Before Each Flight
  - (1) Check trim circuit breaker - IN.
  - (2) Trim Master Switch - ON.
  - (3) AP OFF - Check normal trim operation - UP. Grasp trim wheel and check override capability. Check nose down operation. Recheck override.
  - (4) Activate center bar only - Push rocker fore and aft - only. Trim should not operate with either separate action.
- (d) Autotrim - Before Each Flight
  - (1) AP ON - (Roll and Pitch Sections) Check automatic operation by activating autopilot pitch command UP then DN. Observe trim operation follows pitch command direction.

NOTE

In autopilot mode, there will be approximately a 3 second delay between operation of pitch command and operation of trim.

- (2) Press center bar (AP OFF) - release - check autopilot disengagement.
- (3) Rotate trim wheel to check manual trim operation. Reset to takeoff position prior to takeoff.

AUTOPILOT IN-FLIGHT PROCEDURE

- (a) Trim airplane (Ball Centered).
- (b) Check air pressure or vacuum to ascertain that the directional gyro and attitude gyro are receiving sufficient air.
- (c) Roll Section
  - (1) To engage. Center ROLL knob, push ROLL rocker to "ON" position. To turn, rotate console ROLL knob in desired direction. (Maximum angle of bank should not exceed 30°.)
  - (2) For heading mode, set directional gyro with magnetic compass. Push directional gyro HDG knob in, rotate to select desired heading. Push console heading rocker (HDG) to "ON" position. (Maximum angle to bank will be 20° with heading lock engaged.)
- (d) Pitch Section (Roll section must be engaged prior to pitch section engagement).
  - (1) Center pitch trim indicator with the pitch command disc.
  - (2) Engage pitch rocker switch. To change attitude, rotate pitch command disc in the desired direction.



(e) Altitude Hold

Upon reaching desired or cruising altitude, engage altitude hold mode rocker switch. As long as Altitude Hold mode rocker is engaged, aircraft will maintain selected altitude. For maximum passenger comfort, rate of climb or descent should be reduced to approximately 500 FPM prior to altitude hold engagement. For accurate Altitude Holding below 85 KIAS lower flaps to takeoff position.

NOTE

Prior to disengaging Altitude Hold mode, rotate Pitch Command to center.

(f) Radio Coupling VOR-ILS with H.S.I. type instrument display. (Optional)

(1) VOR Navigation

- a. Tune and identify VOR Station. Select desired course by rotating CRS knob of H.S.I.
- b. Select OMNI mode on Radio Coupler.
- c. Select HDG mode on autopilot console to engage coupler. Aircraft will turn to a 45° intercept angle to intercept the selected VOR course. Intercept angle magnitude depends on radio needle off - course magnitude, 100% needle deflection will result in 45° intercept angle, diminishing as the needle off-set diminishes.
- d. NAV mode - NAV mode provides reduced VOR sensitivity for tracking weak, or noisy, VOR signals. NAV mode should be selected after the aircraft is established on course.

(2) ILS-LOC Front Course

- a. Set inbound, front, localizer course on H.S.I.
- b. Select LOC-Normal on Radio Coupler to intercept and track inbound on the localizer. Select LOC-REV to intercept and track the localizer course outbound to procedure turn area.
- c. Engage HDG mode on autopilot console to engage coupler.

(3) ILS - Back Course

- a. Set inbound, front, localizer course on H.S.I.
- b. Select LOC-REV, on radio coupler to intercept and track inbound on the back localizer course. Select LOC-NORM to intercept and track outbound on the back course to the procedure turn area.
- c. Engage HDG mode on autopilot console to engage coupler.



(g) Radio Coupling - VOR/ILS with standard directional gyro. (Optional)

Radio Coupler operation in conjunction with a standard directional gyro and VOR/LOC display differs from operation with an integrated display (H.S.I.) only in one respect. The HDG bug is used as the radio course datum and therefore must be set to match the desired VOR/ILS course as selected on the O.B.S.

(1) For VOR Intercepts and Tracking:

Select the desired VOR Course and set the HDG bug to the same heading. Select OMNI mode on the coupler and engage HDG mode on the autopilot console.

(2) For ILS Front Course Intercepts and Tracking:

Tune the localizer frequency and place the HDG bug on the inbound, front course heading. Select LOC-NORM mode on the coupler and engage HDG mode on the autopilot console.

(3) For LOC Back Course Intercepts and Tracking:

Tune the localizer frequency and place the HDG bug on the inbound course heading to the airport. Select LOC-REV mode on the coupler and engage HDG mode on the autopilot console.

(h) Coupled Approach Operations

(1) VOR or LOC

- a. After arrival at the VOR Station, track outbound to the procedure turn area as described in Section 4 (f) or (g) as appropriate. Slow to 95 to 104 KIAS, while inbound to F.A.F. and lower flaps to takeoff position (10° extension).
- b. Use HDG mode and Pitch or Altitude Hold modes as appropriate during procedure turn.
- c. At the F.A.F. inbound, return to pitch mode for control of descent.
- d. At the M.D.A. Select Altitude Hold mode and add power for level flight. Monitor altimeter to assure accurate altitude control is being provided by the autopilot.
- e. Go Around. For missed approach select desired pitch attitude with pitch command disc and disengage altitude hold mode. This will initiate the pitch up attitude change. Immediately add takeoff power and monitor Altimeter and rate of climb for positive climb indication. After climb is established, retract flaps and gear. Adjust attitude as necessary for desired airspeed and select HDG mode for turn from the VOR final approach course.



- (2) ILS - Front Course Approach With Glide Slope Capture. (Optional)
- a. Track inbound to L.O.M as described in Section 4 (f) or (g) above and in Altitude Hold mode.
  - b. Inbound to L.O.M slow to 95 to 104 KIAS and lower flaps to takeoff position (10° extension).
  - c. Automatic Glide Slope capture will occur at Glide Slope intercept if the following conditions are met:
    1. Coupler in LOC-Normal mode.
    2. Altitude Hold mode engaged (Altitude Rocker on Console).
    3. Under Glide Slope for more than 20 seconds.
    4. Localizer radio frequency selected on NAV Receiver.
  - d. At Glide Slope Intercept immediately reduce power to maintain 95 to 104 KIAS on final approach. Glide Slope capture is indicated by lighting of the green Glide Slope engage Annunciator Lamp and by a slight pitch down of the aircraft.
  - e. Monitor localizer and Glide Slope raw data throughout approach. Adjust power as necessary to maintain correct final approach airspeed. All power changes should be of small magnitude and smoothly applied for best tracking performance. Do not change aircraft configuration during approach while autopilot is engaged.
  - f. Conduct missed approach maneuver as described in (h) (1) e. above.

NOTE

Glide Slope Coupler will not automatically decouple from Glide Slope. Decoupling may be accomplished by any of the following means:

1. Disengage Altitude Mode.
2. Switch Radio Coupler to HDG Mode.
3. Disengage Autopilot.

SECTION 5 - PERFORMANCE

No changes to the basic performance provided by Section 5 of the Pilot's Operating Handbook are necessary for this supplement.



**SUPPLEMENT 5**

**ALTIMATIC IIC AUTOPILOT INSTALLATION  
(SERIAL NUMBERS 32-7940001 AND UP)**

**SECTION 1 - GENERAL**

This supplement supplies information necessary for the operation of the airplane when the optional AltiMatic IIC Autopilot is installed. The information contained within this supplement is to be used in conjunction with the complete handbook.

This supplement has been "FAA Approved" as a permanent part of this handbook and must remain in this handbook at all times when the optional AltiMatic IIC is installed.

**SECTION 2 - LIMITATIONS**

- (a) Autopilot operation prohibited above 170 KIAS. (Autopilot Vmo)
- (b) Autopilot must be "OFF" during takeoff and landing.
- (c) Required placard P/N 13A660-1 "Conduct Trim Check prior to flight (see P/O/H)" to be installed in clear view of pilot.

**SECTION 3 - EMERGENCY PROCEDURES**

This aircraft is equipped with a Master Disconnect/Interrupt Switch on the pilot's control wheel. When the switch button is depressed it will disconnect the autopilot. When depressed and held it will interrupt all Electric Elevator Trim Operations. Trim operations will be restored when the switch is released. If an autopilot or trim emergency is encountered, do not attempt to determine which system is at fault. Immediately depress and hold the Master Disconnect/Interrupt button. Turn off autopilot and trim master switch and retrim aircraft, then release the interrupt switch.

**NOTE**

During examination of this supplement, the pilot is advised to locate and identify the autopilot controls, the trim master switch and circuit breakers for both systems.



- (a) In the event of an autopilot malfunction the autopilot can be:
- (1) Overpowered at either control wheel.

**CAUTION**

Do not overpower autopilot pitch axis for periods longer than 3 seconds because the autotrim system will operate in a direction to oppose the pilot and will, thereby, cause an increase in the pitch overpower forces.

- (2) Disconnected by depressing the Master Disconnect/Interrupt Switch.
  - (3) Disconnected by depressing the Trim Switch "AP OFF" bar.
  - (4) Disconnected by pushing the roll rocker switch "OFF."
- (b) In the event of a trim malfunction:
- (1) Depress and hold the Master Trim Interrupt Switch.
  - (2) Trim Master Switch - "OFF." Retrim aircraft as necessary using manual trim system.
  - (3) Release Master Interrupt Switch - be alert for possible trim action.
  - (4) Trim Circuit Breaker - Pull. Do not operate trim until problem is corrected.
  - (5) If the trim system operates only in one direction, pull the circuit breaker and do not operate the trim system until corrective action is taken. Monitor autopilot operation closely when operating without trim follow-up.
- (c) If a trim runaway occurs with the autopilot operating, the above procedure will disconnect the autopilot which will immediately result in higher control wheel forces. Be prepared to manually retrim, as necessary to eliminate undesirable forces.
- (d) Altitude Loss During Malfunction:
- (1) An autopilot malfunction during climb, cruise or descent with a 3 second delay in recovery initiation could result in as much as 35° of bank and a 400 ft altitude loss.
  - (2) An autopilot malfunction during an approach with a 1 second delay in recovery initiation could result in as much as 20° of bank and a 180 ft altitude loss. Maximum altitude loss measured in approach configuration and operating either coupled or uncoupled.

**EMERGENCY OPERATION WITH OPTIONAL NSD 360A (HSI)**  
(Slaved and/or Non-Slaved)

- (a) Appearance of HDG Flag:
- (1) Check air supply gauge (vac or pressure) for adequate air supply (4 in. Hg min.).
  - (2) Check NSD 360A circuit breaker.
  - (3) Observe display for proper operation.
- (b) To disable heading card - pull circuit breaker and use magnetic compass for directional data.
- Note: If heading card is not operational, autopilot should not be used.
- (c) With card disabled - VOR and Glide Slope displays are still functional; use card set to rotate card to aircraft heading for correct picture.



- (d) Slaving Failure - (i.e. failure to self-correct for gyro drift):
- (1) Check gyro slaving switch is set to No. 1 position (if equipped with Slave No. 1 or No. 2 switch) or "Slaved" position when equipped with Slaved and Free Gyro Mode Switch.
  - (2) Check for HDG flag.
  - (3) Check compass circuit breaker.
  - (4) Reset heading card while observing slaving meter.

NOTE

A dead slaving meter needle or a needle displaced fully one direction indicates a slaving system failure.

- (5) Select Slaving Amplifier No. 2, if equipped. If not equipped, proceed with step 7 below.
- (6) Reset heading card while checking slaving meter. If proper slaving indication is not obtained, proceed with step 7 below.
- (7) Switch to free gyro mode and periodically set card as an unslaved gyro.

NOTE

In the localizer mode, the "TO-FROM" arrows may remain out of view, depending upon the design of the NAV converter used in the installation.



## SECTION 4 - NORMAL PROCEDURES

### PREFLIGHT INSPECTION - AUTOPILOT

(a) Roll Section

- (1) Place Radio Coupler in "Heading" mode and place roll rocker switch "ON" to engage roll section. Rotate roll command knob left and right and observe that control wheel describes a corresponding left and right turn, then center knob.
- (2) Set proper D.G. Heading on D.G. and turn Heading Bug to aircraft heading. Engage "Heading" mode rocker switch and rotate Heading Bug right and left. Aircraft control wheel should turn same direction as bug. Grasp control wheel and manually override servo, both directions.
- (3) Disengage autopilot by depressing trim switch. Check aileron operation is free and autopilot is disconnected from controls.

(b) Pitch Section

- (1) Engage "Roll" rocker switch.
- (2) Center pitch command disc and engage "Pitch" rocker switch.
- (3) Rotate pitch command disc up and then down and check control yoke moves same direction. Check to see that servo can be overridden by hand at control wheel.

#### NOTE

Autopilot might not be able to raise elevators, on ground, without assistance from pilot.

- (4) Hold control yoke and disengage autopilot by pressing Master Autopilot Disconnect/Trim Interrupt Switch button. Check Roll and Pitch controls to assure autopilot has disconnected.

#### General

This aircraft is equipped with a Command Trim System designed to withstand any type of single malfunction, either mechanical or electrical, without uncontrolled operation resulting. The preflight check procedure is designed to uncover hidden failures that might otherwise go undetected. Proper operation of the electric elevator trim system is predicated on conducting the following preflight check before each flight. If the trim system fails any portion of the procedure, pull the trim circuit breaker out until trim system is repaired. Substitution of any trim system component for another model is not authorized. For emergency interrupt information, refer to Section 3 of this Supplement.

#### Command Electric Trim Switch

The Command Electric Trim Switch on the left hand portion of the pilot's control wheel has two functions:

- (1) When the top bar (AP OFF) is pressed, it disconnects the Autopilot.
- (2) When the top bar is pressed AND the rocker is moved forward, nose down trim will occur, when moved aft, nose up trim will occur.



- (c) **Pre-Flight: Command Trim - Before Each Flight**
  - (1) Check trim circuit breaker - IN.
  - (2) Trim Master Switch - ON.
  - (3) AP OFF - Check normal trim operation - UP. Grasp trim wheel and check override capability. Check nose down operation. Recheck override.
  - (4) Activate center bar only - Push rocker fore and aft - only. Trim should not operate with either separate action.
  
- (d) **Autotrim - Before Each Flight**
  - (1) AP ON - (Roll and Pitch Sections) Check automatic operation by activating autopilot pitch command UP then DN. Observe trim operation follows pitch command direction.

**NOTE**

In autopilot mode, there will be approximately a 3 second delay between operation of pitch command and operation of trim.

- (2) Press center bar (AP OFF) - release - check autopilot disengagement.
- (3) Rotate trim wheel to check manual trim operation. Reset to takeoff position prior to takeoff.

**AUTOPILOT IN-FLIGHT PROCEDURE**

- (a) Trim airplane (Ball Centered).
  
- (b) Check air pressure or vacuum to ascertain that the directional gyro and attitude gyro are receiving sufficient air.
  
- (c) **Roll Section**
  - (1) To engage. Center ROLL knob, push ROLL rocker to "ON" position. To turn, rotate console ROLL knob in desired direction.
  - (2) For heading mode, set directional gyro with magnetic compass. Push directional gyro HDG knob in, rotate to select desired heading. Push console heading rocker (HDG) to "ON" position. (Maximum angle to bank will be 20° with heading lock engaged.)
  
- (d) **Pitch Section (Roll section must be engaged prior to pitch section engagement).**
  - (1) Center pitch trim indicator with the pitch command disc.
  - (2) Engage pitch rocker switch. To change attitude, rotate pitch command disc in the desired direction.



(e) Altitude Hold

Upon reaching desired or cruising altitude, engage altitude hold mode rocker switch. As long as Altitude Hold mode rocker is engaged, aircraft will maintain selected altitude. For maximum passenger comfort, rate of climb or descent should be reduced to approximately 500 FPM prior to altitude hold engagement. For accurate Altitude Holding below 87 KIAS lower flaps to takeoff position.

NOTE

Prior to disengaging Altitude Hold mode, rotate Pitch Command to center.

(f) Radio Coupling VOR-ILS with H.S.I. type instrument display. (Optional)

(1) VOR Navigation

- a. Tune and identify VOR Station. Select desired course by rotating CRS knob of H.S.I.
- b. Select OMNI mode on Radio Coupler.
- c. Select HDG mode on autopilot console to engage coupler. Aircraft will turn to a 45° intercept angle to intercept the selected VOR course. Intercept angle magnitude depends on radio needle off - course magnitude, 100% needle deflection will result in 45° intercept angle, diminishing as the needle off-set diminishes.
- d. NAV mode - NAV mode provides reduced VOR sensitivity for tracking weak, or noisy, VOR signals. NAV mode should be selected after the aircraft is established on course.

(2) ILS-LOC Front Course

- a. Set inbound, front, localizer course on H.S.I.
- b. Select LOC-Normal on Radio Coupler to intercept and track inbound on the localizer. Select LOC-REV to intercept and track the localizer course outbound to procedure turn area.
- c. Engage HDG mode on autopilot console to engage coupler.

(3) ILS - Back Course

- a. Set inbound, front, localizer course on H.S.I.
- b. Select LOC-REV, on radio coupler to intercept and track inbound on the back localizer course. Select LOC-NORM to intercept and track outboard on the back course to the procedure turn area.
- c. Engage HDG mode on autopilot console to engage coupler.



- (g) Radio Coupling - VOR/ILS with standard directional gyro. (Optional)  
Radio Coupler operation in conjunction with a standard directional gyro and VOR/LOC display differs from operation with an integrated display (H.S.I.) only in one respect. The HDG bug is used as the radio course datum and therefore must be set to match the desired VOR/ILS course as selected on the O.B.S.
- (1) For VOR Intercepts and Tracking:  
Select the desired VOR Course and set the HDG bug to the same heading. Select OMNI mode on the coupler and engage HDG mode on the autopilot console.
  - (2) For ILS Front Course Intercepts and Tracking:  
Tune the localizer frequency and place the HDG bug on the inbound, front course heading. Select LOC-NORM mode on the coupler and engage HDG mode on the autopilot console.
  - (3) For LOC Back Course Intercepts and Tracking:  
Tune the localizer frequency and place the HDG bug on the inbound course heading to the airport. Select LOC-REV mode on the coupler and engage HDG mode on the autopilot console.
- (h) Coupled Approach Operations
- (1) VOR or LOC
    - a. After arrival at the VOR Station, track outbound to the procedure turn area as described in Section 4 (f) or (g) as appropriate. Slow to 95 to 104 KIAS, while inbound to F.A.F. and lower flaps to takeoff position (10° extension).
    - b. Use HDG mode and Pitch or Altitude Hold modes as appropriate during procedure turn.
    - c. At the F.A.F. inbound, return to pitch mode for control of descent.
    - d. At the M.D.A. Select Altitude Hold mode and add power for level flight. Monitor altimeter to assure accurate altitude control is being provided by the autopilot.
    - e. Go-Around. For missed approach select desired pitch attitude with pitch command disc and disengage Altitude Hold mode. This will initiate the pitch up attitude change. Immediately add takeoff power and monitor Altimeter and rate of climb for positive climb indication. After climb is established, retract flaps and gear. Adjust attitude as necessary for desired airspeed and select HDG mode for turn from the VOR final approach course.



- (2) ILS - Front Course Approach With Glide Slope Capture. (Optional)
- a. Track inbound to L.O.M. as described in Section 4 (f) or (g) and in Altitude Hold mode.
  - b. Inbound to L.O.M. slow to 95 to 104 KIAS and lower flaps to takeoff position (10° or 25° extension).
  - c. Automatic Glide Slope capture will occur at Glide Slope intercept if the following conditions are met:
    1. Coupler in LOC-Normal mode.
    2. Altitude Hold mode engaged (Altitude Rocker on Console).
    3. Under Glide Slope for more than 30 seconds.
    4. Localizer radio frequency selected on NAV Receiver.
  - d. At Glide Slope Intercept immediately reduce power to maintain approximately 90 to 95 KIAS on final approach. Glide Slope capture is indicated by lighting of the green Glide Slope engage Annunciator Lamp and by a slight pitch down of the aircraft.
  - e. Monitor localizer and Glide Slope raw data throughout approach. Adjust power as necessary to maintain correct final approach airspeed. All power changes should be of small magnitude and smoothly applied for best tracking performance. Do not change aircraft configuration during approach while autopilot is engaged.
  - f. Conduct missed approach maneuver as described in (h) (l) e. above.

NOTE

Glide Slope Coupler will not automatically decouple from Glide Slope. Decoupling may be accomplished by any of the following means:

1. Disengage Altitude Mode.
2. Switch Radio Coupler to HDG Mode.
3. Disengage Autopilot.

SECTION 5 - PERFORMANCE

No changes to the basic performance provided by Section 5 of the Pilot's Operating Handbook are necessary for this supplement.



**SUPPLEMENT 6**

**PIPER ELECTRIC PITCH TRIM**

**SECTION 1 - GENERAL**

This supplement supplies information necessary for the operation of the airplane when the optional Piper Electric Pitch Trim is installed. The information contained within this supplement is to be used in conjunction with the complete handbook.

This supplement has been "FAA Approved" as a permanent part of this handbook and must remain in this handbook at all times when the optional Piper Electric Pitch Trim is installed.

**SECTION 2 - LIMITATIONS**

No changes of the basic limitations provided by Section 2 of this Pilot's Operating Handbook are necessary for this supplement.

**SECTION 3 - EMERGENCY PROCEDURES**

In case of malfunction, disengage electric pitch trim by operating push button trim switch on instrument panel.

In emergency, electric pitch trim may be overpowered using manual pitch trim.

In cruise configuration, malfunction results in 10° pitch change and 50 ft altitude variation.

**SECTION 4 - NORMAL PROCEDURES**

The electric trim system may be turned ON or OFF by a switch located above the ignition switch. The pitch trim may be changed when the electric trim system is turned on either by moving the manual pitch trim control wheel or by operating the trim control switch on the pilot's control yoke.

**SECTION 5 - PERFORMANCE**

No changes to the basic performance provided by Section 5 of this Pilot's Operating Handbook are necessary for this supplement.



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# TABLE OF CONTENTS

## SECTION 10

### SAFETY TIPS

Paragraph No.	Page No.
10.1 General	10-1
10.3 Safety Tips	10-1



SECTION 10  
SAFETY TIPS

10.1 GENERAL

This section provides safety tips of particular value in the operation of the Cherokee Six.

10.3 SAFETY TIPS

- (a) Learn to trim for takeoff so that only a very light back pressure on the control wheel is required to lift the airplane off the ground.
- (b) Trying to pull the airplane off the ground at too low an airspeed decreases the controllability of the airplane in the event of engine failure.
- (c) Flaps may be lowered at airspeeds up to 109 KIAS. To reduce flap operating loads, it is desirable to have the airplane at a slower speed before extending the flaps. The flap step will not support weight if the flaps are in any extended position. The flaps must be placed in the "UP" position before they will lock and support weight on the step.
- (d) Before attempting to reset any circuit breaker, allow a two to five minute cooling off period.
- (e) Before starting the engine, check that all radio switches, light switches and pitot heat switch are in the off position so as not to create an overloaded condition when the starter is engaged.
- (f) Strobe lights should not be operating when flying through overcast and clouds, since reflected light can produce spacial disorientation. Do not operate strobe lights when taxiing in the vicinity of other aircraft.
- (g) The rudder pedals are suspended from a torque tube which extends across the fuselage. The pilot should become familiar with the proper positioning of his feet on the rudder pedals so as to avoid interference with the torque tube when moving the rudder pedals or operating the toe brakes.
- (h) In an effort to avoid accidents, pilots should obtain and study the safety related information made available in FAA publications such as regulations, advisory circulars, Aviation News, AIM and safety aids.
- (i) Prolonged slips or skids which result in excess of 2000 feet of altitude loss, or other radical or extreme maneuvers which could cause uncovering of the fuel outlet must be avoided as fuel flow interruption may occur when tank being used is not full.