Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

Cessna Aircraft Company

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

1984 Model T303

Serial No. ____________________

Registration No. ______________

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY FAR PART 23 AND CONSTITUTES THE FAA APPROVED AIRPLANE FLIGHT MANUAL.

Cessna Aircraft Company
Wichita, Kansas USA

Member of GAMA

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STARTING ENGINES (NORMAL)

1. Throttles -- CLOSED.
2. Propellers -- HIGH RPM.
3. Mixtures -- RICH.
4. Propeller Area -- CLEAR (both sides).
5. Battery and Alternator Switches -- ON.
6. Gear Down Indicator Lights -- ON.
7. Magneto Switches -- ON.
8. Primer Switch -- ON (left).
9. Left Throttle -- ADVANCE to obtain approximately 60 PPH fuel flow; then RETARD to IDLE.
10. Primer Switch -- OFF.
11. Left Starter -- ENGAGE.
12. Left Throttle -- ADVANCE slightly.
13. Left Starter -- RELEASE when engine starts.

NOTE

The engine should start in two or three revolutions. If it does not continue running, start again at step 8 above. If the engine does not start, leave the primer off, set the mixture to idle cut-off, open the throttle, and crank the engine until it fires or for approximately 15 seconds. If still unsuccessful, start again using the normal starting procedure after allowing the starter motor to cool.

14. Left Throttle -- 800-1000 RPM.
15. Left Oil Pressure -- CHECK.
16. Left Starter Engaged Light -- OFF.
17. Left Alternator and Low Voltage Warning Lights -- OFF.
18. Right Engine -- REPEAT STEPS 8 THROUGH 15.
19. Right Starter Engaged Light -- OFF
20. Right Alternator Warning Light -- OFF.
21. Flashing Beacon and Navigation Lights -- ON as required.
22. Avionics Power Switches -- ON.
23. Radios -- ON.

STARTING ENGINES (24-28 VOLT EXTERNAL POWER)

1. Throttles -- CLOSED.
2. Propellers -- HIGH RPM.
3. Mixtures -- RICH.
4. Propeller Area -- CLEAR (both sides).

TAXIING

1. Passenger Briefing -- COMPLETE.
2. Brakes -- CHECK.
3. Flight Instruments -- CHECK turn instruments.

BEFORE TAKEOFF

1. Parking Brake -- SET.
2. Seats, Seat Belts, Shoulder Harnesses -- CHECK SECURE.
3. Cabin Door -- CLOSED and LOCKED (annunciator light off).
4. Flight Controls -- FREE and CORRECT.
5. Flight Instruments -- SET and CHECKED.
6. Mixtures -- RICH.
7. Fuel Quantities -- RECHECK.
8. Fuel Selectors: Left Engine -- NORMAL FLIGHT.
   Right Engine -- NORMAL FLIGHT.
9. Emergency Crossfeed Shutoff -- OFF (push in).
10. Elevator, Rudder and Aileron Trim -- SET for takeoff.
11. Throttles -- 1700 RPM.
    a. Magnetos -- CHECK (RPM drop should not exceed 150 RPM on either magneto or 50 RPM differential between magnetos).
    b. Propellers -- CHECK feathering to 800 RPM; return to high RPM (full forward).
    c. Suction Gage -- CHECK.
    d. Alternators -- CHECK warning lights out, ammeter normal.
    e. Engine Instruments -- CHECK.
12. Throttles -- 1000 RPM.
13. Quadrant Friction Lock -- ADJUST.
14. Known Icing System (if installed) Preflight -- COMPLETE in accordance with Known Icing Equipment supplement in Section 9 prior to any flight in icing conditions.
15. Strobe Lights (if installed) -- AS DESIRED.
16. Yaw Damper -- OFF.
17. Annunciator Panel -- CHECK.
18. Radios and Avionics -- SET.
19. Autopilot -- PREFLIGHT TEST (see Section 9), then OFF.
20. Synchrophaser (if installed) -- AS DESIRED.
21. Wing Flaps -- SET for takeoff (see Takeoff Checklist).
22. Cowl Flaps -- OPEN.
23. Emergency Exit -- CLOSED and LATCHED (if opened for ventilation).
24. Auxiliary Fuel Pumps -- ON.
25. Takeoff Procedure -- SELECT Normal, Short Field or Hot Day procedure.

CAUTION

Prior to taxiing onto the runway on warm humid or hot days with heated engine(s) (oil and cylinder temperatures near mid scale or higher), select the Hot Day Takeoff procedure and review it to determine the minimum RPM that will allow acceptable takeoff and climbout performance.

NOTE

The Hot Day Takeoff procedure includes both Normal and Short Field techniques, a reduced fuel flow schedule to help restore possible RPM loss due to richness, and performance penalties incurred in the event RPM loss is not fully restored.

26. Parking Brake -- RELEASE.

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps -- UP to 10°.
2. Power -- 32.5 INCHES Hg and 2400 RPM.
3. Mixtures -- ADJUST to 160-165 PPH fuel flow.
4. Power Instruments -- CHECK both engines.
5. Elevator Control -- LIFT NOSE WHEEL at 70-75 KIAS with light back pressure.
6. Brakes -- APPLY momentarily when airborne.
7. Landing Gear -- RETRACT in climb-out.
8. Climb Speed -- 85-95 KIAS until a safe altitude is reached.
9. Wing Flaps -- RETRACT (if extended) after obstacles are cleared.

SHORT FIELD TAKEOFF

1. Wing Flaps -- 10°.
2. Brakes -- APPLY and HOLD.
3. Power -- 32.5 INCHES Hg and 2400 RPM.
4. Mixtures -- ADJUST to 160 PPH fuel flow.

NOTE

Start takeoff roll when 32.5 INCHES Hg manifold pressure is noted on both engines and fuel flow has stabilized.

5. Brakes -- RELEASE.
6. Elevator Control -- LIFT NOSE WHEEL at 70-75 KIAS with light back pressure.
7. Climb Speed -- 80 KIAS (at maximum weight) until all obstacles are cleared.
8. Brakes -- APPLY momentarily when airborne.
9. Landing Gear -- RETRACT.
10. Wing Flaps -- RETRACT after obstacles are cleared.

HOT DAY TAKEOFF

1. Wing Flaps -- UP to 10° (10° for short field).
2. Brakes -- APPLY and HOLD.
3. Power -- 32.5 INCHES Hg and 2400 RPM.

NOTE

If maximum RPM is less than normal and engine operation and indications are otherwise normal, lean the mixture within the limits tabulated under mixture (below) to help restore RPM prior to start of takeoff.

4. Mixtures -- ADJUST to 160 PPH fuel flow or to the following schedule if RPM is low due to richness.

RPM	Minimum Fuel Flow (PPH)
2200	130
2250	135
2300	140
2350	145
2400	150

CAUTION

Readjust mixture as RPM increases. Do not operate with fuel flows below minimums specified above.

CAUTION

If maximum RPM remains less than 2300 on either engine, abort takeoff attempt and have condition corrected.

5. Power Recheck -- 32.5 INCHES Hg and 2400 RPM or considered (2300 RPM minimum).

WARNING

With RPM lower than normal (but not less than 2300 RPM), do not start takeoff unless the effect of the resulting performance penalties (determined from following table) have been considered acceptable.

CAUTION

Minimize time of operation at maximum power before takeoff. If performance penalties need to be considered, or are not acceptable, reduce power and taxi clear of runway. Cool engines and recheck power prior to takeoff.

		Maximum RPM, Start Of Takeoff 2300	2350
*	Takeoff Distance (Ground Roll and Total To Clear 50-Foot Obstacle)	15% Increase	5% Increase
*	Accelerate-Stop Distance	10% Increase	5% Increase
*	Takeoff Rate Of Climb	120 FPM Decrease	***
**	Single-Engine Rate Of Climb	70 FPM Decrease	***
**	Single-Engine Service Ceiling	2800 Foot Decrease	***

* Use average RPM of both engines to determine penalty.
** Use RPM of engine with lowest RPM, if different.
*** No penalty expected since maximum RPM should increase to normal at takeoff.

6. Brakes -- RELEASE.

NOTE

Monitor RPM and fuel flow during takeoff roll. RPM, if low at start, will normally tend to increase 50 to 75 RPM prior to takeoff.

7. Elevator Control -- LIFT NOSE WHEEL at 70-75 KIAS with light back pressure.
8. Climb Speed -- 80 KIAS (for Short Field Takeoff at maximum weight) until all obstacles are cleared, or 85-95 KIAS (for Normal Takeoff) until a safe altitude is reached.
9. Brakes -- APPLY momentarily when airborne.
10. Landing Gear -- RETRACT in climb out.
11. Wing Flaps -- RETRACT (if extended) after obstacles are cleared.
12. Mixtures -- ADJUST to 160 PPH fuel flow.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 115-125 KIAS.
2. Power -- 24 INCHES Hg and 2400 RPM.
3. Auxiliary Fuel Pumps -- OFF unless fuel flow fluctuates.
4. Mixtures -- ADJUST for 95 PPH.
5. Cowl Flaps -- AS REQUIRED.

altitudes, are subjected to abnormal landing gear abuse. Frequently check all components of the landing gear, shock struts, tires, and brakes. If a shock strut is insufficiently extended, undue landing and taxi loads will be subjected on the airplane structure.

To prevent loss of fuel in flight, make sure the fuel tank filler caps are tightly sealed after any fuel system check or servicing. Fuel system vents should also be inspected for obstructions, ice or water, especially after exposure to cold, wet weather.

STARTING ENGINES

It is recommended that the left engine be started first, particularly in cold weather, because of its proximity to the battery. However, the right engine may be started first, if desired.

The continuous-flow fuel injection system will start spraying fuel in the intake ports as soon as the throttle and mixture controls are opened and either the primer or the auxiliary fuel pump are turned on. If the primer or auxiliary pump is turned on accidentally while the engine is stopped, with the throttle open and the mixture rich, solid fuel will collect temporarily in the cylinder intake ports, the quantity depending on the amount of throttle opening and the length of time the pump has been operating. If this happens, it is advisable to wait a few minutes until this fuel drains away before starting the engine. To avoid flooding, turn the primer switch off promptly when the fuel flow reaches 60 PPH during preparation for engine start. The primer is normally used for all engine starts.

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

Engine mis-starts characterized by sufficient power to take the engine away from the starter but dying in 3 to 5 revolutions are the result of an excessively lean mixture after the start and can occur in warm or cold temperatures. Repeat the starting procedure but allow additional priming time with the primer switch ON before cranking is started. If extremely hot temperatures have caused vapor which prevents a start, it will be necessary to place the primer switch ON for 5 to 10 seconds or more to flush the vapor through the fuel lines until the fuel flow reaches 60 PPH. Then turn off the primer and proceed with normal starting procedures.

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

the center of its range before stopping, thus ensuring that the control is positioned properly when next turned on.

For best operation, it is important to guard against propeller control creeping by setting the quadrant friction lock tightly. On long flights, where the unit may be operating near either extremity of its operating range, it may be necessary to periodically switch to the OFF position, reset the propeller control levers, and re-engage the synchrophaser.

FUEL SYSTEM

The fuel system (see figure 7-9) consists of two vented, integral fuel tanks (one in each wing), two selector valves, two fuel strainers, two auxiliary fuel pumps, and an engine-driven fuel pump, fuel flow (pressure) limiter, fuel/air control unit, fuel distributor manifold, and fuel-injection nozzles on each engine. Two crossfeed shutoff valves are also incorporated into the system.

Engine-driven fuel pump suction draws fuel from each tank to two three-position selector valves. The selector valves are controlled by handles on the fuel selector panel labeled FUEL TANK SELECTOR, LEFT ENGINE, RIGHT ENGINE. Each selector valve handle has positions labeled NORMAL FLIGHT (green colored sector), CROSSFEED, LEVEL FLIGHT ONLY (yellow colored sector), and OFF (red colored sector). With the LEFT ENGINE selector handle and RIGHT ENGINE selector handle in the green sectors, fuel from the selector valves is routed through the fuel strainers, then through a bypass in each auxiliary fuel pump (when not in operation) to the engine-driven fuel pumps. The engine-driven fuel pumps deliver the fuel to fuel/air control units where it is metered. A fuel flow (pressure) limiter restricts pressure at the inlet to the control unit such that the metered fuel flow does not exceed a maximum of 165 PPH. The metered fuel is then routed to a distributor manifold on each engine which distributes it to the cylinders. Vapor and excess fuel from the engine-driven pumps and fuel flow (pressure) limiter are returned directly to the wing tanks.

The normal fuel routing is from the left tank and left selector valve to the left engine, and from the right tank and right selector valve to the right engine. However, for the purpose of maintaining or reestablishing lateral trim, it is permissible to operate both engines from a single tank in level cruising flight under certain conditions. If single-tank operation is initiated with nearly full tanks, it must be remembered that vapor and excess fuel from each engine-driven fuel pump is being returned to its normal tank system, and the tank not being used is continuously refilling. To prevent the tank from overflowing, switch back to normal fuel manage-

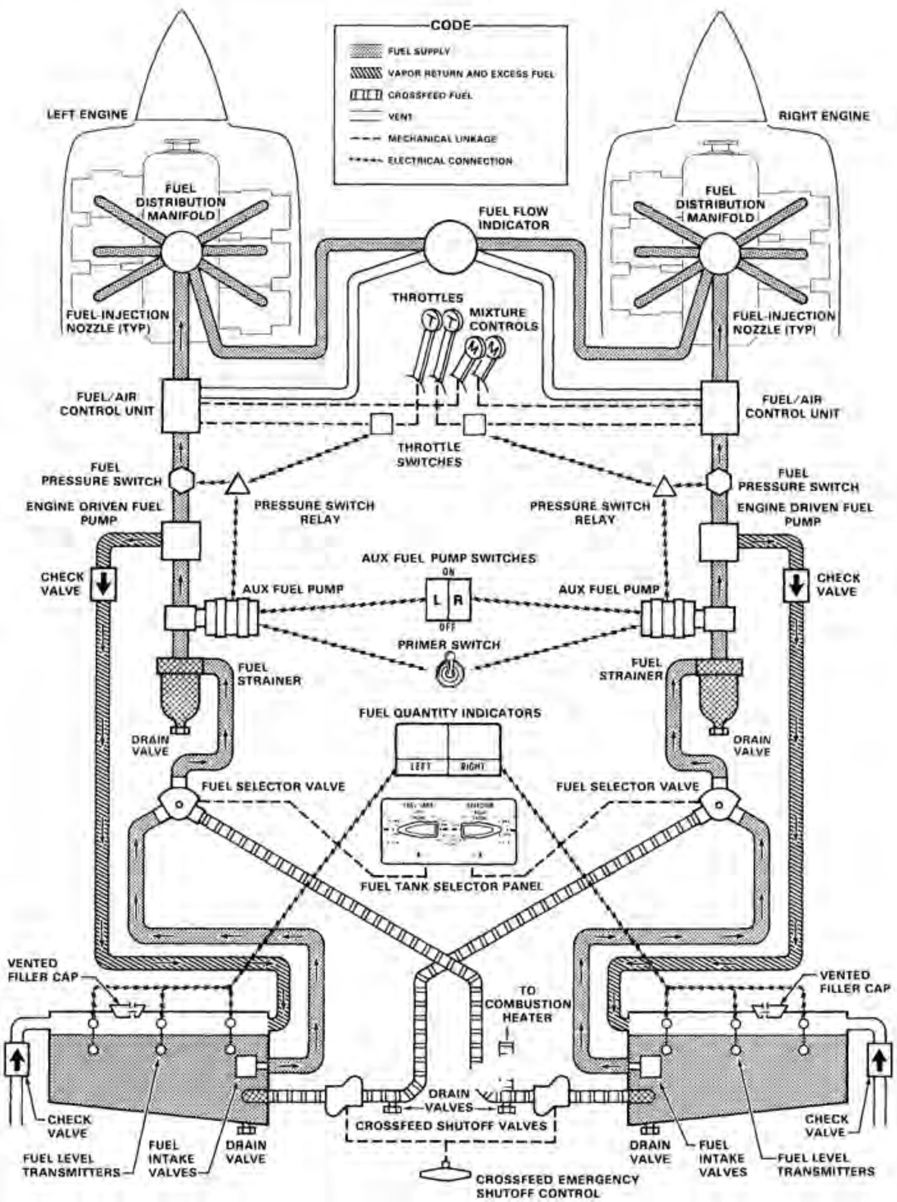

Figure 7-9. Fuel System

FUEL QUANTITY DATA				
UNITS OF MEASURE	FUEL LEVEL (QUANTITY EACH TANK)	TOTAL FUEL	TOTAL UNUSABLE	TOTAL USABLE ALL FLIGHT CONDITIONS
POUNDS	FULL (465)	930	12	918
U.S. GALLONS	FULL (77.5)	155	2.0	153

Figure 7-10. Fuel Quantity Data

ment procedures when the fuel quantity in the unused tank indicates 60 pounds below full. If single-tank operation is being used when fuel levels are low, the fuel quantity in the tank in use should not be allowed to drop below 60 pounds prior to reestablishing normal single-engine per tank operation; this will avoid the possibility of dual engine stoppage due to fuel starvation.

NOTE

The fuel selector valve handles must be turned to the NORMAL FLIGHT, L. TANK, T.O./LDG (green sector) position for the left engine and the NORMAL FLIGHT, R. TANK, T.O./LDG (green sector) position for the right engine for takeoff, landing, and all normal operations. Crossfeeding is limited to level flight only.

The amount of unusable fuel is minimal due to the specially designed fuel system. Under normal fuel feed conditions, the maximum unusable fuel quantity, as determined from the most critical flight condition, is 6 pounds per tank. This quantity was not exceeded by any other reasonable flight condition, including prolonged 1-minute, full-rudder sideslips in the landing configuration.

During single-engine operation, fuel can be used from either tank through the use of the normal (green sector) and crossfeed (yellow sector) positions of the fuel selector valve handles. Again, the normal (unused) tank should not be allowed to continue refilling when it is 60 pounds or more below full during crossfeeding, to prevent tank overflow due to vapor and excess fuel return flow. Use of fuel from the right and left tanks alternately will maintain lateral trim. Remember, however, that single-engine landings must be accomplished with the fuel selector for the operating engine turned to the normal tank position (green sector).

In single-engine cruise flight when crossfeeding has been done to use all the fuel in the opposite tank, a continuation of fuel flow must be assured as the new tank is being selected. Therefore, when switching from the dry tank to the tank containing fuel, place the appropriate auxiliary fuel pump switch momentarily in the ON position until normal fuel flow has been restored.

The fuel system supplying each engine is equipped with its own venting system, which is essential to fuel system operation. Blockage of either venting system will result in a decreasing fuel flow from the respective fuel tank, and eventual stoppage of the respective engine. Venting is accomplished by check valve-equipped vent lines attached to the left and right fuel tanks which terminate at each wing tip trailing edge. Also, the fuel filler caps are equipped with vacuum-operated vents which open, allowing air into the tanks should the fuel tank vent lines become blocked.

Fuel quantity is measured by six electrically-operated fuel quantity transmitters (three in each wing tank) and indicated by two electrically-operated fuel quantity indicators on the lower portion of the pedestal above the fuel selector handles. The indicators are marked in pounds (top scale) and gallons (bottom scale) with a red line indicating an empty tank. When an indicator shows an empty tank, approximately one gallon remains in the tank as unusable fuel. The indicators cannot be relied upon for accurate readings during skids, slips, or unusual attitudes. If both indicator pointers should rapidly move to a zero reading, check the cylinder head temperature and oil temperature gages for operation. If these gages are not indicating, an electrical malfunction has occurred.

The fuel quantity indicating system may include a low fuel warning feature. The system consists of two amber warning lights, labeled L. LOW FUEL and R. LOW FUEL, on the pilot's annunciator panel. When illuminated, these lights signify that fuel quantity in the respective fuel tank is 60 pounds (10 gallons) or less.

The auxiliary fuel pumps are activated to low boost and armed for high boost by two yellow rocker switches on the lower left side of the instrument panel. The switches are labeled AUX FUEL PUMP, LEFT ENG., RIGHT ENG. These switches are OFF in the lower position and, when placed in the upper ON position, provide either low or high boost. Low boost will be provided any time the auxiliary fuel pump switches are in the ON position and the fuel pressure switches, located in the unmetered fuel pressure lines, have not sensed a fuel pressure lower than 5 PSI. High boost is provided **any time** the fuel pressure switches have sensed a pressure lower than 5 PSI, the auxiliary fuel pump switches have been turned

ON, and the throttles are advanced beyond approximately 15-18 inches Hg. Throttle positions are sensed by throttle switches placed in the quadrant and connected to circuits containing the auxiliary fuel pumps, the auxiliary fuel pump switches, the fuel pressure switches, and the pressure switch relays.

NOTE

The fuel pressure switches will "arm" the auxiliary fuel pumps to activate to high boost only when the fuel pressure drops below 5 PSI while the corresponding auxiliary fuel pump switch is in the ON position and the throttle is advanced beyond approximately 15 to 18 inches Hg. The auxiliary fuel pumps are "disarmed" by turning the auxiliary fuel pump switches OFF or by retarding the throttles below approximately 15 to 18 inches Hg.

The auxiliary fuel pump switches are turned ON for takeoff, landing, and any time vapor is suspected in the system. The auxiliary fuel pump switching circuitry is designed to supply adequate fuel flow to maintain engine power in the event of an engine-driven fuel pump malfunction.

Under hot day-high altitude conditions, or conditions during a climb which are conducive to fuel vapor formation, it may be necessary to utilize the auxiliary fuel pumps to attain or stabilize the fuel flow required for the type of climb being performed. Select the ON position and adjust the mixtures to the desired fuel flow, as required. If fluctuating fuel flow (greater than 5 PPH) is observed during climb or cruise on hot days, place the appropriate auxiliary fuel pump switch in the ON position to clear the fuel system of vapor. The auxiliary fuel pumps may be operated continuously in flight, if necessary. Each time the fuel pump switches are turned ON or OFF, the mixtures may require readjustment.

The fuel system is equipped with drain valves to provide a means for the examination of fuel in the system for contamination and grade. The system should be examined before the first flight of every day and after each refueling by using the fuel sampler provided to drain fuel from the wing tank sump drains, the fuel strainer drains, and the crossfeed line drains. The fuel tank sump drains are located just outboard of each main landing gear well and the fuel strainer drains are located just outboard of each main gear shock strut. Crossfeed line drains are located at the lower surface of the leading edge of each wing near the fuselage intersection. If any evidence of fuel contamination is found, it must be eliminated in accor-

dance with the Preflight Inspection checklist and the discussion in Section 8 of this handbook. The fuel tanks should be filled after each flight to minimize condensation.

HYDRAULIC SYSTEM

Hydraulic power is supplied by an electrically-driven hydraulic power pack (see figure 7-11) located forward of the instrument panel at floor level between the pilot's and front passenger's rudder pedals. The power pack's only function is to supply hydraulic power for operation of the retractable landing gear. This is accomplished by applying hydraulic pressure to actuator cylinders which extend or retract the gear. The electrical portion of the power pack is protected by two "pull-off" type circuit breakers labeled LDG GEAR, CONT, and PUMP. These circuit breakers are 5-amp and 30-amp, respectively, and are located on the left sidewall switch and circuit breaker panel.

The hydraulic power pack is turned on, and the direction of actuation is selected by the landing gear lever when it is placed in either the gear-up or gear-down position. When the gear has fully extended and locked, a series of switches will illuminate indicator lights on the instrument panel to show gear position. A hydraulic pressure switch will automatically turn off the power pack when hydraulic pressure reaches a preset value.

The hydraulic system includes an emergency hand pump to permit manual extension of the landing gear in the event of hydraulic power pack or electrical system failure. The hand pump is located on the cabin floor between the front seats.

During normal operations, the landing gear should require from 6 to 9 seconds to fully extend or retract. For malfunctions of the hydraulic and landing gear systems, refer to Section 3, Emergency Procedures.

BRAKE SYSTEM

The airplane has a single-disc, hydraulically-actuated brake mounted inboard on each main landing gear wheel. Each brake is connected by a hydraulic line to a master cylinder attached to each of the pilot's rudder pedals. The brakes are operated by applying pressure to the top of either the left (pilot's) or right (front passenger's) set of rudder pedals which are interconnected. When the airplane is parked, both main wheel brakes may be set by utilizing the parking brake which is operated by a handle on the lower instrument panel directly beneath the pilot's control column. To