

SHORT FIELD TAKEOFF

Brakeshold
Throttlesfull forward
Manifold pressurechecked
Prop speed2575 RPM
Brakesrelease
Rotate71 KIAS
Accelerate tobarrier speed (87 KIAS)

Alter the barrier has been cleared:

Gearretract
Flapsretract
Accelerate toBest Single Engine
Angle of Climb Speed
(93 KIAS)

CLIMB

Maximum Normal Operating Power (when
safely clear of obstacles or terrain)39.5" MP, 2400 RPM
Mixture (28 GPH min. 475° CHT
max., 1500° EGT max.)LEAN
Cowl flapsas required
Emergency fuel pumpsOFF
Air conditioneras desired
Seat belts and no smoking signas required
Oxygenas required

CRUISE

Fuel selectorsOUTBOARD OR INBOARD
Powerset
Cowl flapsas required
Mixtureleaned

The three rheostats feed back to the amplifier the signals necessary to operate the system. One rheostat is located in the flap position selector and one each is located so as to sense the positions of the right and left flaps independently. The selector rheostat signals the amplifier, activating the motor, which positions the flaps. The left flap rheostat controls flap position in relation to the selector rheostat position and provides information to the amplifier to drive the position indicator. The right flap rheostat must agree with the left flap rheostat within 5° at all times or the system will shut down and cannot be reactivated until the imbalance and/ or the cause has been corrected.

The system also incorporates a FLAP annunciator light that will illuminate when an imbalance exists between the right and left wing flap rheostats or a critical component of the amplifier has failed.

Before takeoff, the operation of the FLAP annunciator may be checked while the flaps are in transit, by pushing the test switch located adjacent to the flap position indicator.

7.19 FUEL SYSTEM

The fuel system consists of fuel cells, engine driven fuel pumps, fuel boost pumps, emergency fuel pumps, fuel injectors, control valves, fuel filters, fuel pressure and flow gauges, fuel drains and non-icing NACA fuel tank vents and a fuel selector panel. (Figure 7-15). Lockable filler caps are available as optional equipment.

Fuel is stored in four flexible fuel cells, two in each wing. The outboard fuel cells have a capacity of 40 U.S. gallons each, and the inboard cells have a capacity of 56 U.S. gallons each, providing a total fuel capacity of 192 gallons, 183.4 of which are usable. Each individual fuel cell incorporates its own fuel senders, screened outlet, sump drain valve, vent line check valves and filler assemblies available with optional lightning shielded caps.

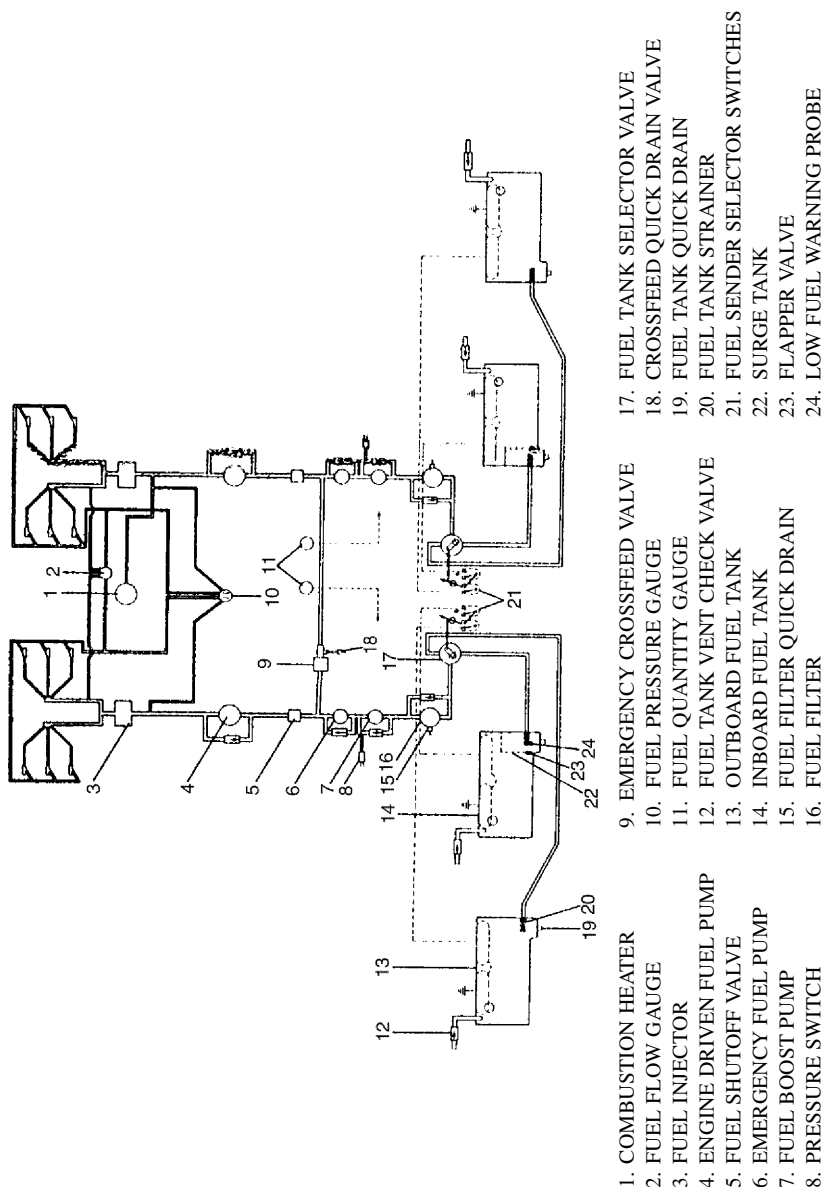
The four fuel sump drains for the fuel tanks are located along the bottom of the wings: one just outboard of each wheel well and one on the inboard of each wing near the wing root fillet plate assemblies. On the fuel filter assemblies, attached to the inboard wing ribs, are fuel filter drains, accessible through a door on the bottom of the wing root fillet plate. A crossfeed drain is located on the left wing root fillet plate inboard of the tank drain. All of the fuel drains incorporate quick drain valves to provide speedy fuel contamination checks. (Refer to Section 8 - Airplane Handling,

The right and left wing fuel systems are independent of each other and are connected only when the crossfeed system is activated. Under normal operation, fuel is routed from the fuel cells, through the selector valve and fuel filter to the fuel boost pump. Fuel from the fuel boost pump travels through the emergency fuel pump, the fire wall shutoff valve and the engine driven fuel pump to the fuel injector and then to the cylinders.

Emergency fuel pumps are installed to provide fuel pressure in the event an engine driven pump fails. The emergency fuel pumps are also used under normal conditions for takeoff, landing and, when necessary, priming the engines. Left and right emergency fuel pump switches are located on the overhead panel to the right of the fuel gauges.

The fuel boost pumps are operated continuously and are provided to maintain fuel under pressure to the other fuel pumps, improving the altitude performance of the fuel system. Each fuel boost pump is controlled by a separate circuit breaker located in the circuit breaker control panel. The fuel boost pumps are activated when the master switch is turned on and continue to operate until the master switch is turned off or the fuel boost pump circuit breakers are pulled (off). Red fuel boost pump warning lights, mounted in the annunciator panel, provide a visual indication of an inoperative fuel boost pump. The lights incorporate a press-to-test button which, when depressed, should illuminate both lights. If a fuel boost pump inoperative indication (light on) occurs in flight, it should not be necessary to turn the emergency fuel pump on unless the fuel pressure falls below 30 psi.

Two electric fuel quantity gauges are mounted in the overhead switch panel. The right fuel quantity gauge indicates the quantity of fuel in the selected right fuel system tank (right inboard or right outboard), and the left fuel quantity gauge indicates the quantity of fuel in the selected left fuel system tank (left inboard or left outboard). The fuel gauges are connected electrically to micro switches mounted in the fuel selector console. The fuel senders are also connected electrically to the micro switches. When a fuel tank is selected, its corresponding micro switch is actuated, completing the circuit between the fuel senders and the fuel quantity gauge, providing a visual reading of the fuel quantity in the selected tank. The gauges are illuminated, and the lights are controlled by a rheostat switch on the left side of the overhead switch panel.



FUEL SYSTEM SCHEMATIC

Figure 7-15

Fuel flow and fuel pressure for the left and right engine fuel systems are monitored by a dual fuel flow gauge and a dual fuel pressure gauge. The fuel flow gauge, mounted either in the top area or the right edge area of the under portion of the instrument panel, measures both the right and left engine fuel system fuel flow in U.S. gallons per hour. The fuel pressure gauge, mounted on the instrument panel above and to the right of the copilot's control column, measures the fuel pressure in pounds per square inch for both the left and right engine fuel systems.

WARNING

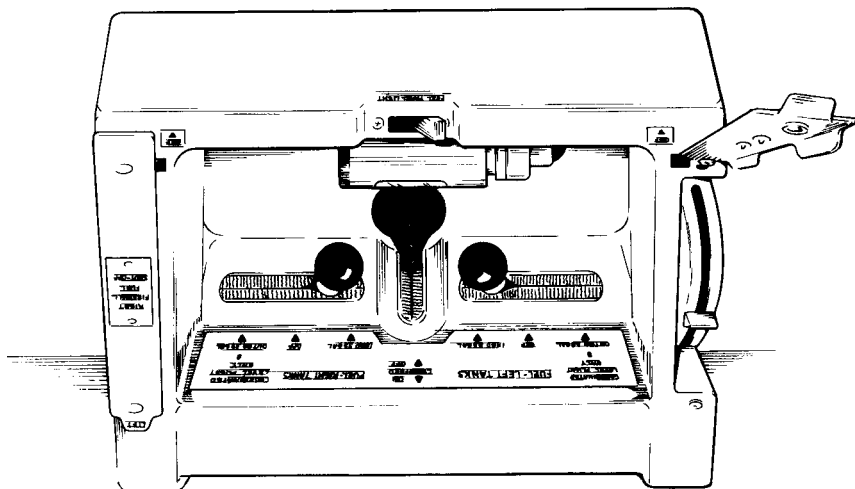
If either the right or left fuel flow warning light illuminates and the fuel gauge indicates fuel remaining in the corresponding inboard tank, this will indicate a malfunction of the flapper door in the inboard tank. Immediately select the outboard tank or select crossfeed to avoid fuel flow interruption.

Right and left fuel flow warning lights illuminate to warn the pilot of an impending fuel flow interruption. The lights are activated by a sensing probe mounted near each inboard fuel tank outlet. In the event the fuel level near the tank outlet drops to a point where a fuel flow interruption and power loss could occur, the sensing probe will illuminate its corresponding warning light. The warning light will be on for a minimum of 10 seconds and will remain on if the cause is not corrected. The warning lights are incorporated in the annunciator panel. For press-to-test procedures, refer to Paragraph 7.25.

The fuel management controls (Figure 7-17) are located in the fuel system control panel mounted between the front seats on the forward edge of the wing spar carry-through cover. Located on the fuel control panel are the fuel tank selectors, fire wall fuel shutoffs and the crossfeed controls. A fuel control panel light and switch are mounted at the top of the panel.

During normal operation of the fuel system, each engine is supplied with fuel from its respective fuel supply. Selection of the controls on the right side of the control panel provides fuel from the right inboard or outboard fuel cells to the right engine and left fuel control selection provides fuel from the left inboard or outboard fuel cells to the left engine.

For emergencies, fuel from one system can supply the opposite engine through the use of the crossfeed system. The crossfeed valve is located at the inboard rib assembly of the left wing butt area and is intended for emergency use only. The crossfeed is controlled by a knob in the center of the fuel control panel, and under all normal conditions should be in the off (aft) position.



FUEL SYSTEM CONTROL PANEL

Figure 7-17

NOTE

The crossfeed system is not intended for normal operation. When the crossfeed valve is on, be certain the fuel selector valve on the tank not in use is off, and the procedures outlined in Section 3 - Emergency Procedures are followed.

Emergency fire wall fuel shutoff valves are installed in both the right and left engine fuel systems. The valves are actuated by controls on the left and right sides of the fuel system control panel. Since the fire wall shutoff valves are intended for emergency use only, they are provided with covers which must be lifted before the valves can be turned off. The covers are designed to prevent them from being closed when the fire wall shutoff valve controls are in the off position, preventing inadvertent activation and insuring a normal valve-open position with the cover closed. The valves are open when the lever is down.

Fuel to supply the combustion heater is provided by the right engine fuel system. (Refer to paragraph 7.39 in this section.)

7.21 ELECTRICAL SYSTEM

Electrical power is supplied by a 28-volt, direct current, negative ground electrical system. Standard electrical supply equipment includes alternators, starters, voltage regulators, overvoltage relays, an ammeter, a battery, an external power receptacle, circuit breakers, warning lights, switches and solenoids.

The electrical system is controlled by switches located in the overhead panel (Figure 7-23 or 7-24) and the circuit breaker control panel (Figure 7-21). The circuit breaker control panel, located on the side panel to the left of the pilot, provides circuit protection and control for a complement of standard and optional electrical equipment and accessories. All switches and circuit breakers are marked to their individual functions. Switches are mainly of the toggle or rocker type and circuit breakers are of the push to reset or circuit breaker switch type. If a circuit breaker pops, automatically opening the overloaded circuit, it is recommended that the breaker be allowed to cool before resetting. The circuit breakers can be manually tripped by pulling out on the reset button.