
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, non-icing NACA fuel tank vents and a fuel selector panel.

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, 186 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.

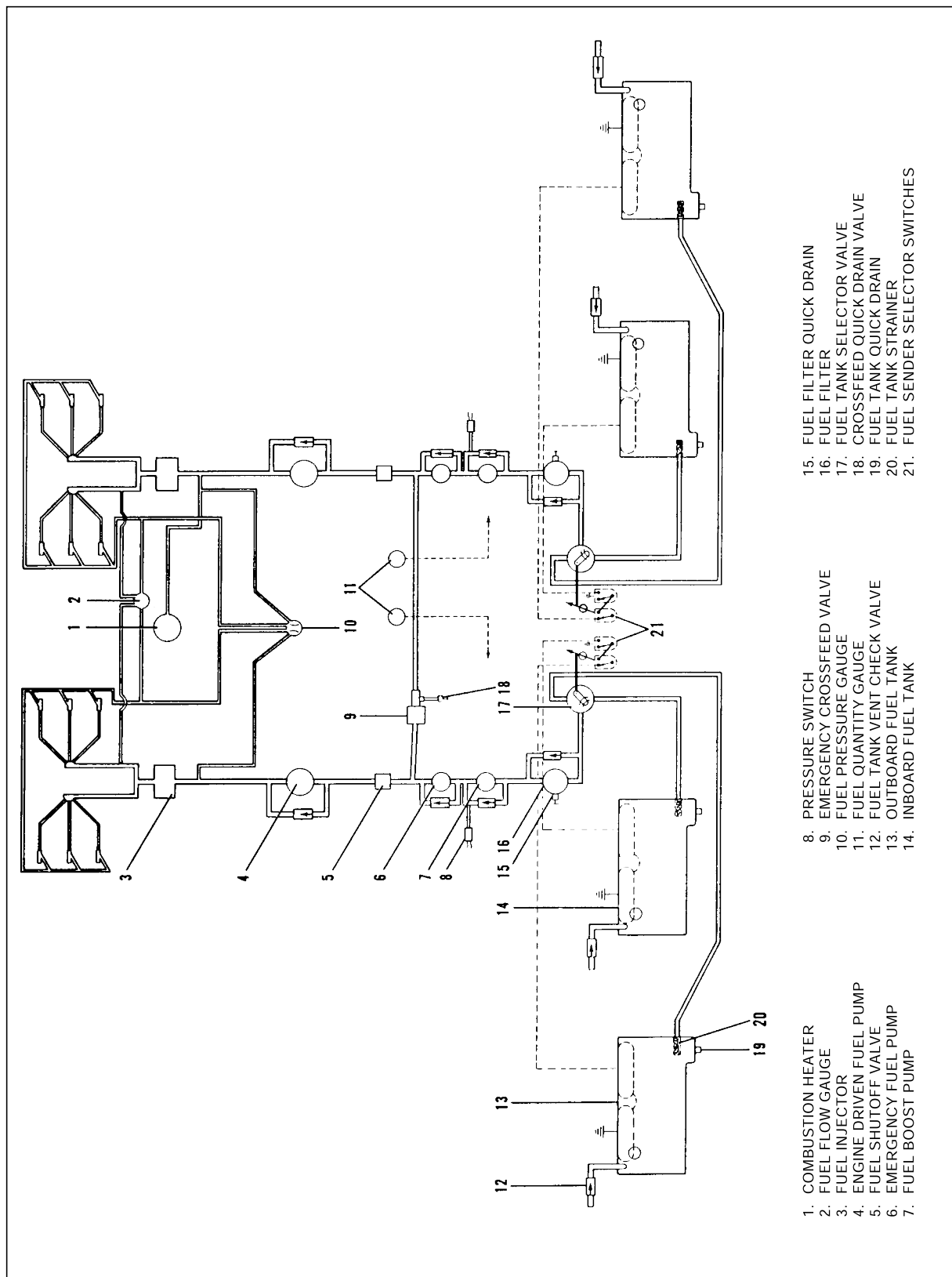
The four **fuel sump drains** for the fuel tanks are located along the bottom of the wings: one just outboard of each wheel well and one on the inboard of each wing near the wing root fillet plate assemblies. On the fuel filter assemblies, attached to the inboard wing ribs, are **fuel filter drains**, 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. (See Handling and Servicing Section.)

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.

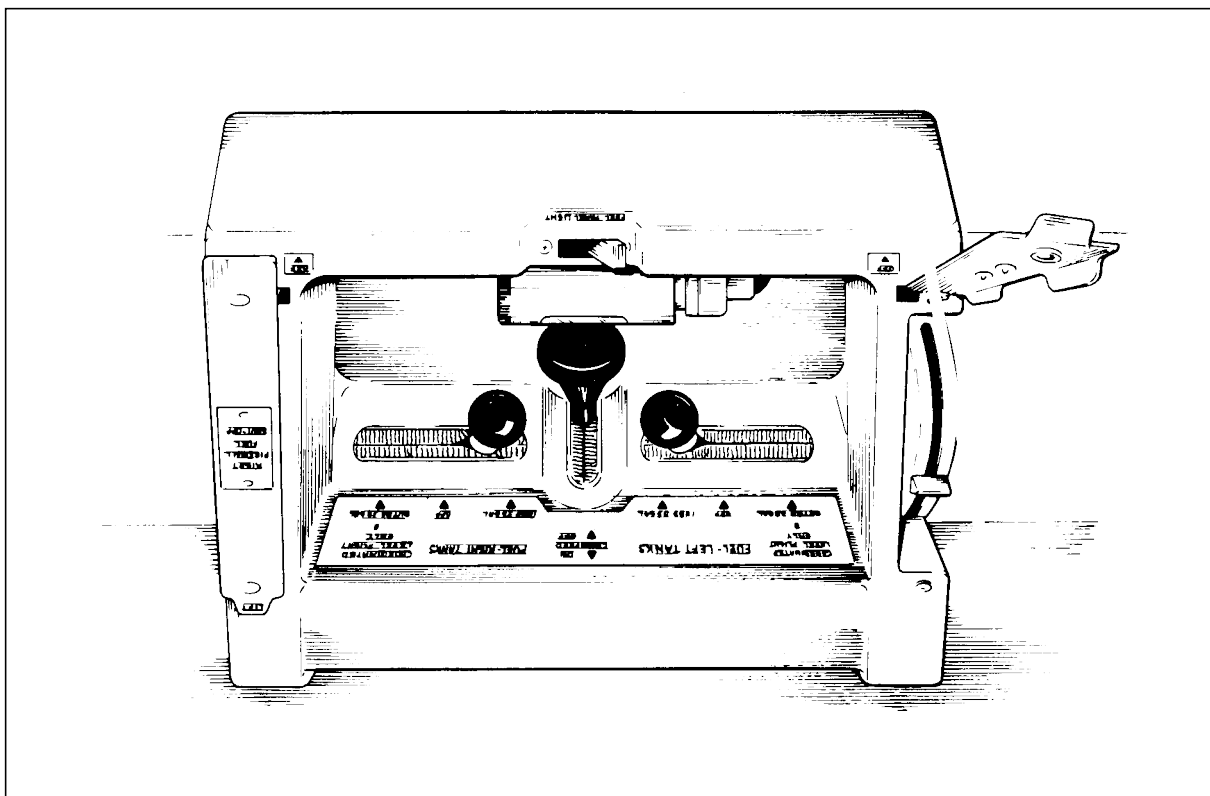
Emergency fuel pumps are installed to provide fuel pressure in the event an engine driven pump fails. The emergency fuel pumps are also used under normal conditions for takeoff, landing and, when necessary, priming the engines. Left and right **emergency fuel pump switches** are located on the overhead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

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 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 at the base of the windshield divider 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 gauges** are mounted in the overhead switch panel. The right gauge indicates the fuel quantity in the right wing fuel cells and the left gauge indicates the fuel quantity in the left wing fuel cells. The gauges are connected electrically to the fuel selector and indicate the fuel quantity of the cell selected. 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



Fuel System Control Panel

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 on the instrument panel above and to the right of the control pedestal, 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**, mounted at the base of the windshield divider post, 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 lights are provided with a "press-to-test" feature. To test, depress the button mounted in the center of the light cluster for 3 seconds; the lights should illuminate and remain on for 10 seconds. During this test, the fuel boost pump inoperative lights mounted below the fuel flow warning lights should illuminate when the button is depressed (no hold required on this circuit), and go out when the button is released.

The **fuel management** controls 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, (See Airplane Flight Manual). 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 position.

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 the Airplane Flight Manual 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.

Fuel to supply the combustion heater is provided by the right engine fuel system. (Refer to Heating and Ventilating System in this section.)

PERFORMANCE (cont)

ALTITUDE CRUISE SPEED, FUEL CONSUMPTION AND RANGE

BHP** PER ENGINE	CRUISE ALTITUDE (FEET)	AVE. CRUISE SPEED (MPH)	FUEL FLOW (GPH - TOTAL)	RANGE (STA. MILES)* STANDARD 183.5 GAL.	45 MIN. RESERVES
BEST ECONOMY MIXTURE — INTERMEDIATE ALTITUDE					
245	12,000	227	33.1	1205	1055
210	12,000	213	29.0	1275	1125
180	12,000	195	25.6	1315	1165
BEST ECONOMY MIXTURE — OPTIMUM ALTITUDE					
245	20,000	244	33.1	1255	1100
210	20,000	227	29.0	1315	1160
180	16,000	199	25.6	1325	1170
BEST POWER MIXTURE — INTERMEDIATE ALTITUDE					
245	12,000	232	40.9	1010	855
210	12,000	219	35.9	1075	920
180	12,000	201	31.7	1105	950
BEST POWER MIXTURE — OPTIMUM ALTITUDE					
245	22,000	253	40.9	1070	910
210	24,000	239	35.9	1120	955
180	16,000	207	31.7	1125	965

*Range computed for taxi, takeoff, climb at 85% MCP, cruise at stated mixture and descent.

**Power levels shown are for best power mixture; a 4.5% power loss results when leaned to best economy mixture.