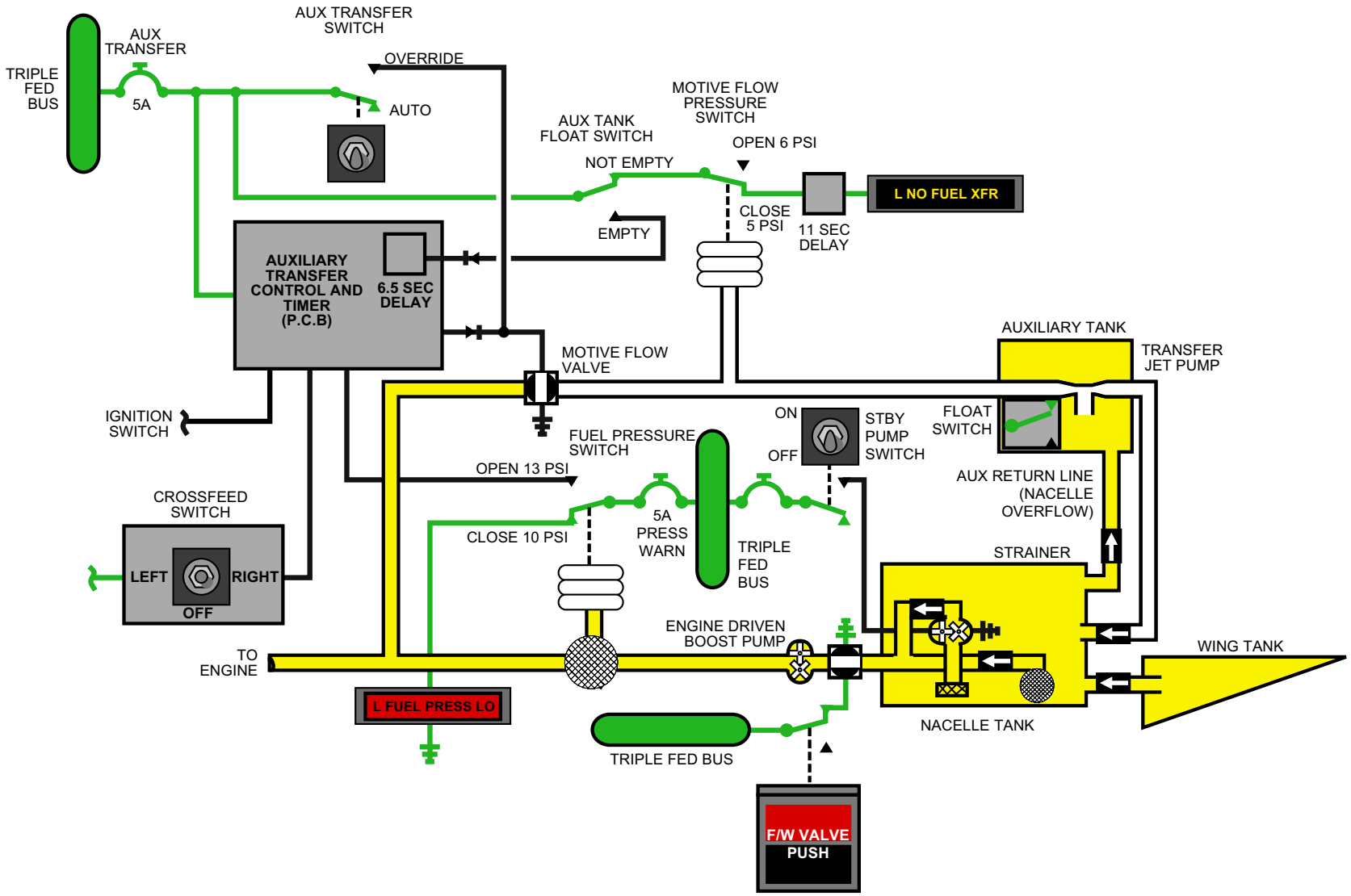
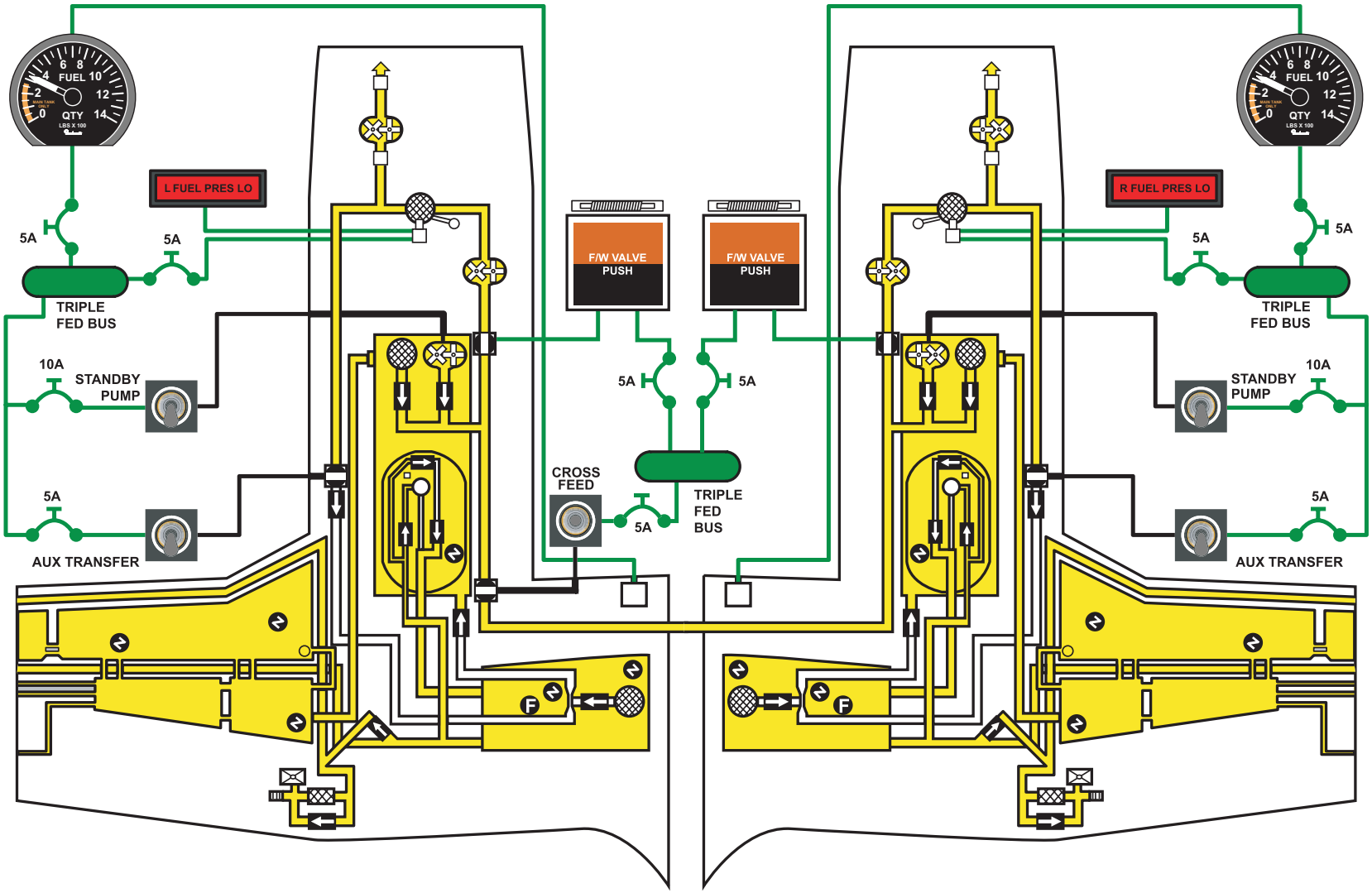
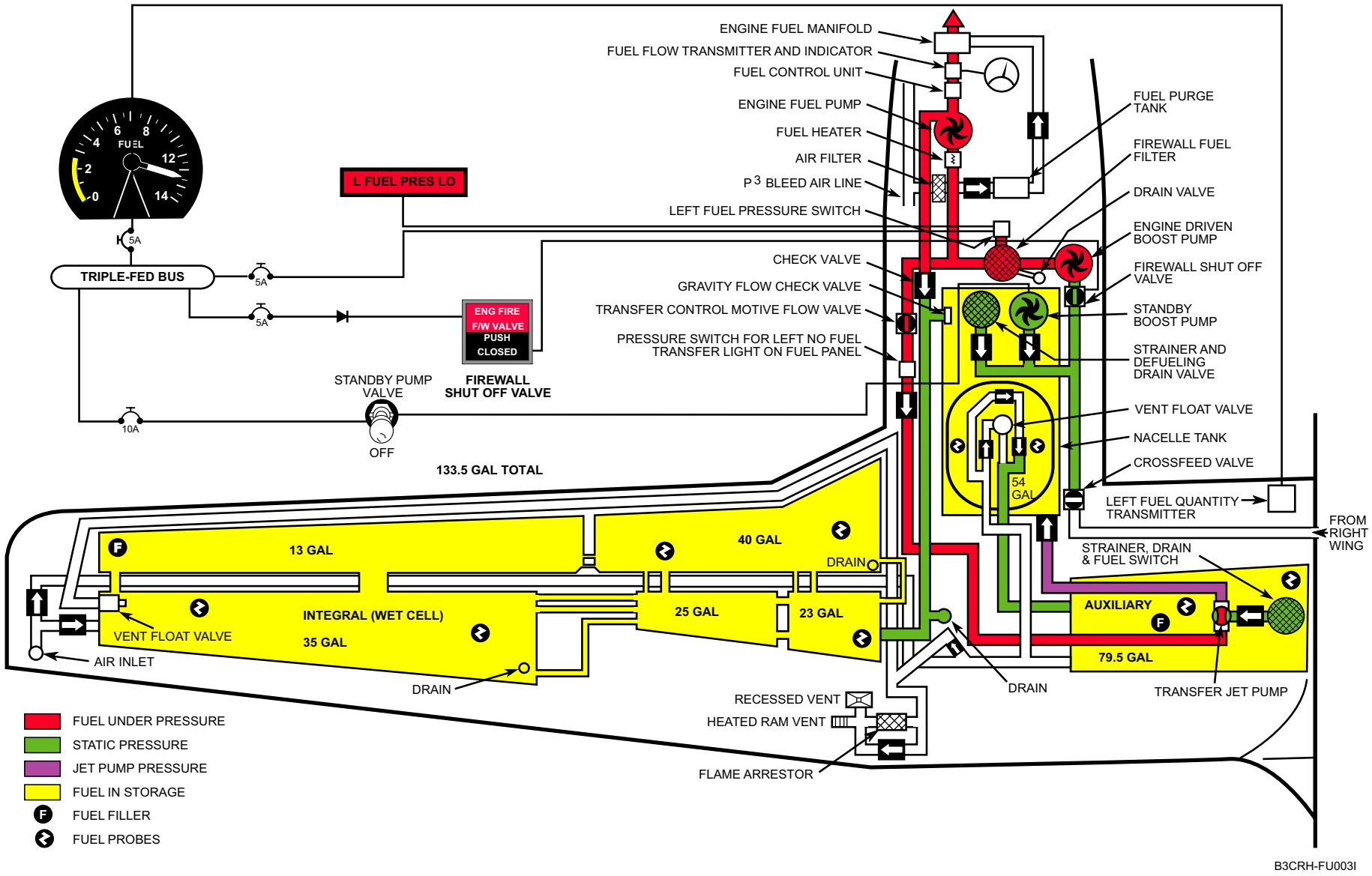
Auxiliary Fuel Transfer System



Fuel Crossfeed



Fuel System
King Air 350



Fuel

The airframe fuel system includes fuel storage, venting, indicating, and distribution. Refer to the Powerplant chapter for engine fuel and fuel control systems. Refueling is covered in the Servicing chapter.

Storage

Wing and auxiliary fuel tanks hold a usable total of 539 US gallons. Each wing tank consists of five interconnected tanks and a nacelle tank behind the engine. These tanks are either bladder or integral type. Fuel from the wing tank gravity feeds into the nacelle tank.

From the nacelle tank, an engine-driven fuel boost pump supplies fuel under pressure to the engine through a firewall fuel shutoff valve. Placing a firewall shutoff valve switch in the CLOSED position electrically drives the valve closed.

The auxiliary fuel tank consists of a center section tank in each wing root. Because these tanks are lower than the rest of the fuel tanks, transfer jet pumps are used to pump fuel to the nacelle tank.

Drain valves at tank low points permit fuel sampling and water removal. These drains are forward of the wheel well (nacelle tank), outboard of the nacelle (leading edge tank), halfway out on the wing (integral tank), and on the middle of the wing root (auxiliary tank). A drain valve permits removal of contaminants from the gravity feed line that connects the wing and nacelle tanks.

Indicating

A capacitance-type fuel indicating system provides accurate measurement of fuel quantity regardless of fuel temperature and type.

As fuel level rises and falls in a fuel tank, probe capacitance increases and decreases proportionately. The fuel indicating system then produces an output current to drive the fuel gages. Normally, the fuel gages display main tank quantity in pounds. Placing the fuel selector switch in AUXILIARY displays auxiliary fuel tank quantity.

Venting

The wing and auxiliary fuel tanks vent to atmosphere through a pair of vents on the wing underside near the engine nacelle. Each pair of vents has an unheated recessed vent and a heated ram air vent. If one vent clogs, the other continues to provide tank venting.

The outer wing tanks vent to each other and then to atmosphere through a vent float valve near the wing tip and a pair of vents on the lower wing surface. The float valve connects to a vent line running the length of the outboard wing section. The vent line then connects to an unheated recessed vent through a check valve and to a heated ram air vent through a flame arrestor.

An air inlet and two suction relief valves in the wing tip prevent fuel siphoning through the venting system. One of the pressure relief valves connects to the air inlet while the other one connects the float valve to a siphon break line.

The nacelle tank also has a vent float valve and two suction relief valves. From the float valve, a vent line connects this tank to the two wing vents.

When the auxiliary fuel tank is full, its float-operated check valve closes to prevent fuel loss through the venting system. The tank then vents to atmosphere through the vent line connected to the integral wing tank. As the fuel level in this tank drops, the check valve opens and the tank vents directly through the two wing vents.

Tank	Gallons	Pounds	Liters	Kilograms
Left Main	190	1273	719	577
Left Auxiliary	79.5	533	301	242
Right Main	190	1273	719	577
Right Auxiliary	79.5	533	301	242
Total Usable	539	3611	2040	1638

Table 4E-A; Usable Fuel Capacity

Distribution

Fuel either gravity flows from the wing tank or is pumped from the auxiliary tank to the nacelle tank. Each nacelle tank supplies fuel to its engine through the firewall fuel shutoff valve.

During engine operation, the engine's fuel boost pump draws fuel from the nacelle tank and provides it under pressure to the engine. If this pump fails, an electrically driven standby fuel boost pump in the nacelle tank provides pressurized fuel. The standby boost pump also moves fuel during crossfeed.

With the respective STANDBY PUMP switch on, 28V DC from the Triple-fed Bus powers the standby boost pump.

A jet transfer pump transfers fuel from the auxiliary tank to the nacelle tank. With the engine-driven or standby fuel pumps operating, motive flow fuel operates the transfer pump. With the AUX TRANSFER switch placed in the AUTO position, control of the motive flow valve is maintained by the Auxiliary Transfer Control Module. The control module will prevent the

motive flow valve from opening if any or all of the following conditions are detected: selection of crossfeed, ignition on, no fuel pressure, or auxiliary tank empty.

With the motive flow valve open, fuel is directed from the engine-driven or standby pump into the jet transfer pump located in the auxiliary tank. The transfer pump moves fuel from the auxiliary tank to its nacelle tank. Excess fuel delivered by the transfer pump flows back into the auxiliary tank through a float valve and overflow line at the top of the nacelle tank.

A pressure switch downstream from the motive flow valve monitors fuel pressure in the motive flow fuel supply line. If a boost pump fails, ignition is activated, crossfeed is selected, or motive fuel pressure falls below 6 PSI with fuel remaining in the auxiliary tank, the motive flow pressure switch illuminates the NO TRANSFER annunciator. Placing the AUX TRANSFER switch in OVERRIDE bypasses the control circuitry to open the motive flow valve.

Once fuel is consumed from the auxiliary tank, the tank float switch provides an empty signal to the Auxiliary Transfer Control Module. After a short time delay to allow for fuel sloshing, the module removes power from the normally closed motive flow valve, closing it.

Once the auxiliary tank empties, the tank's float switch provides an empty signal to the control circuitry. After a 30 to 50 second delay, the motive flow valve closes.

A single-valve crossfeed system supplies fuel from an inoperative engine's tanks to the opposite engine. Its use is restricted to single engine operation. With an inoperative right engine, for example, place the CROSSFEED FLOW switch to the left. This action opens the crossfeed valve, energizes the right engine's electric boost pump, and closes the left engine's motive flow valve. A CROSSFEED annunciator provides indication that the crossfeed valve has reached an OPEN position. Fuel under pressure then moves from the right side to the left side.

Fuel Systems

Main Fuel System

Power Source	Triple-fed bus
Distribution	Wing tanks (gravity feed) to nacelle tank Nacelle tank to engine
Control	Switches STANDBY PUMP CROSSFEED FIREWALL SHUTOFF VALVES CROSSFEED (closes motive flow valve on receiving side, opens crossfeed valve, turns on standby boost pump on feeding sides, and eliminates crossfeed annunciator)
Monitor	Main fuel gages Fuel flow indicator Annunciators FUEL CROSSFEED FUEL PRESS
Protection	Circuit breakers Check valves Fuses Fuel drain system Fuel filters (pressure switches) Vent system Oil/Fuel heat exchanger

Auxiliary Fuel System

Power Source	Motive flow
Distribution	Auxiliary (center) tank (automatic transfer to nacelle tank with AUX TRANSFER switch in AUTO)
Control	Switches AUX TRANSFER OVERRIDE – AUTO (opens motive flow valve)
Monitor	Aux fuel gages NO TRANSFER lights
Protection	Circuit breakers Fuses