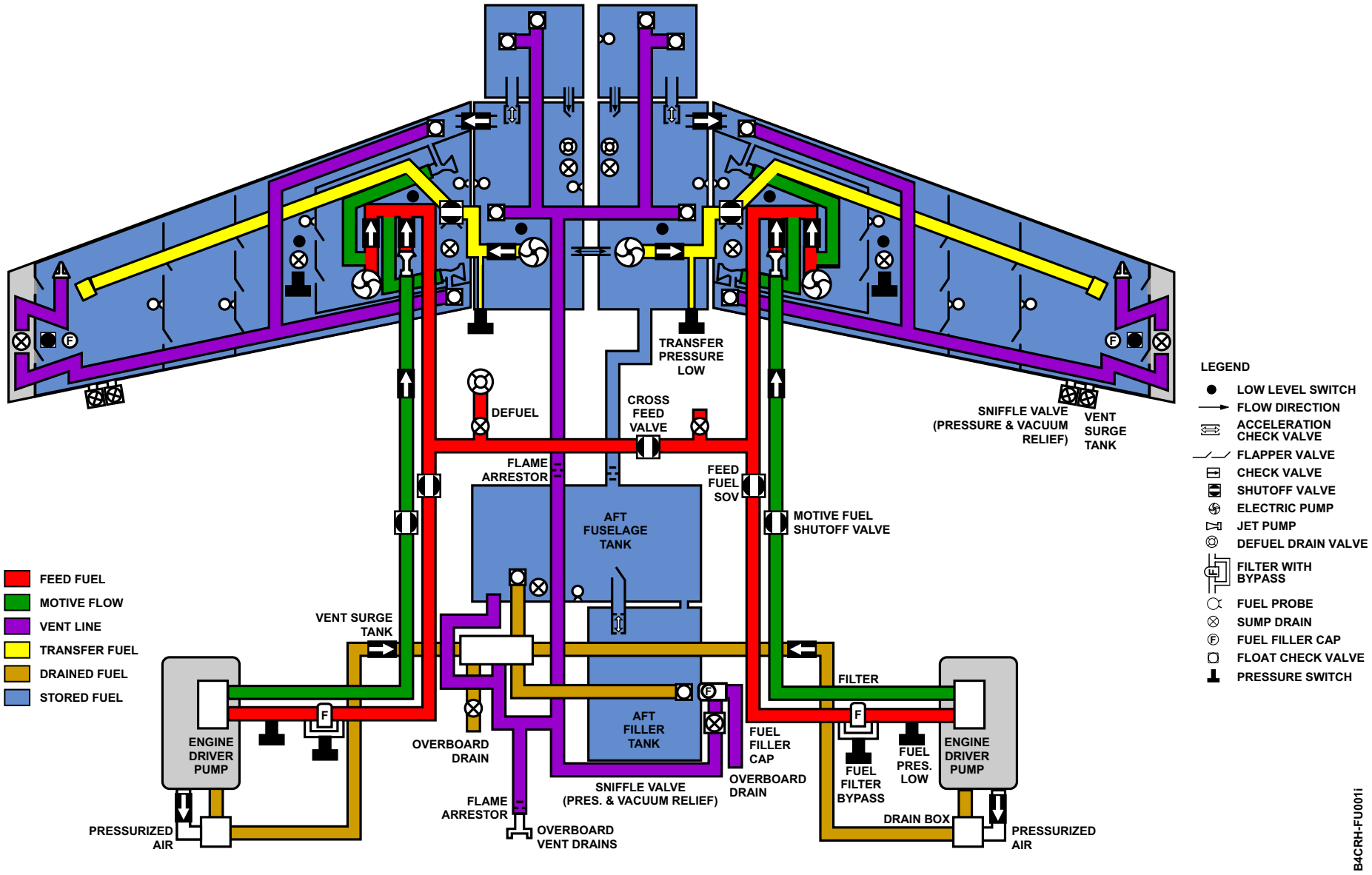
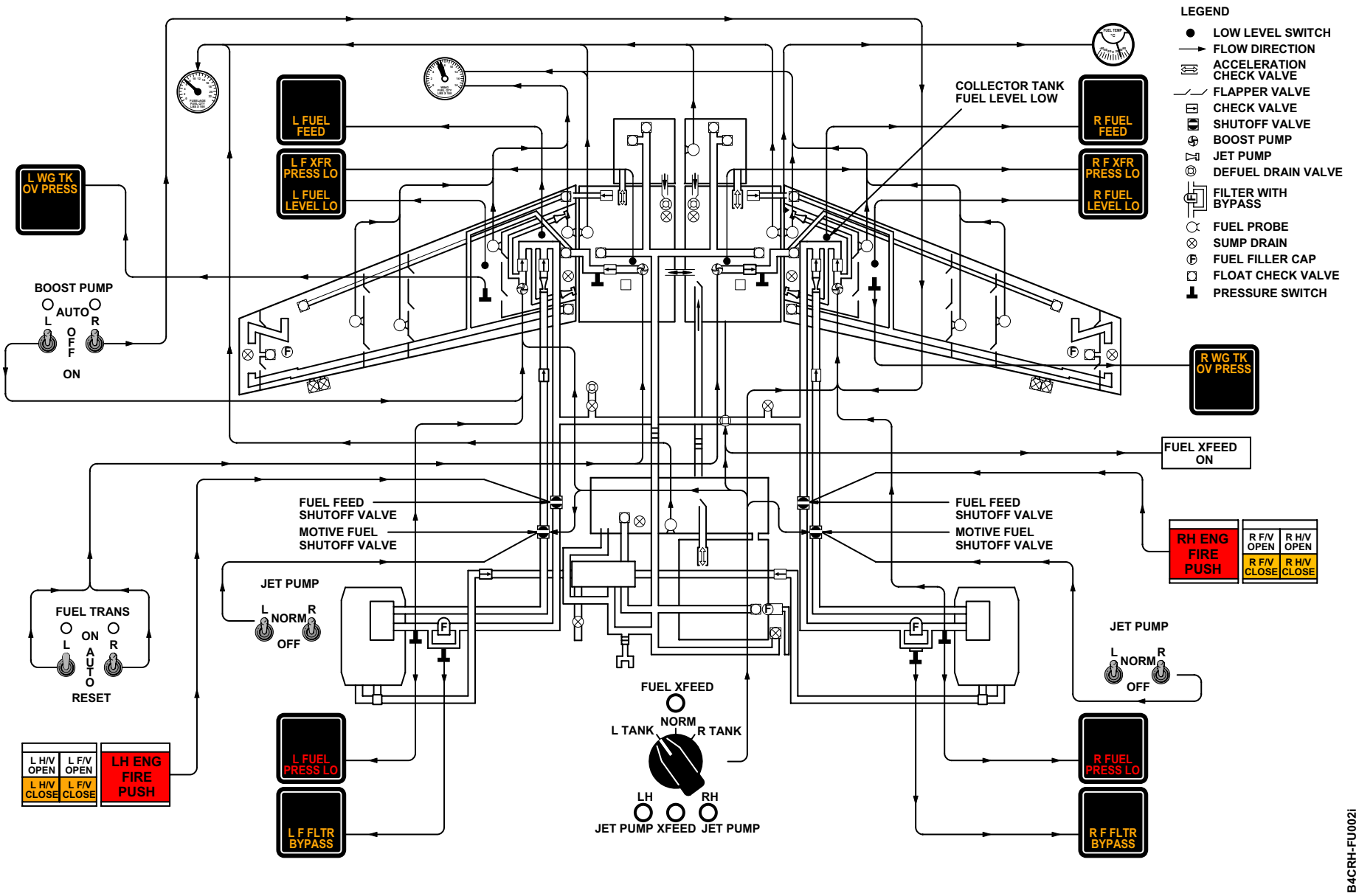
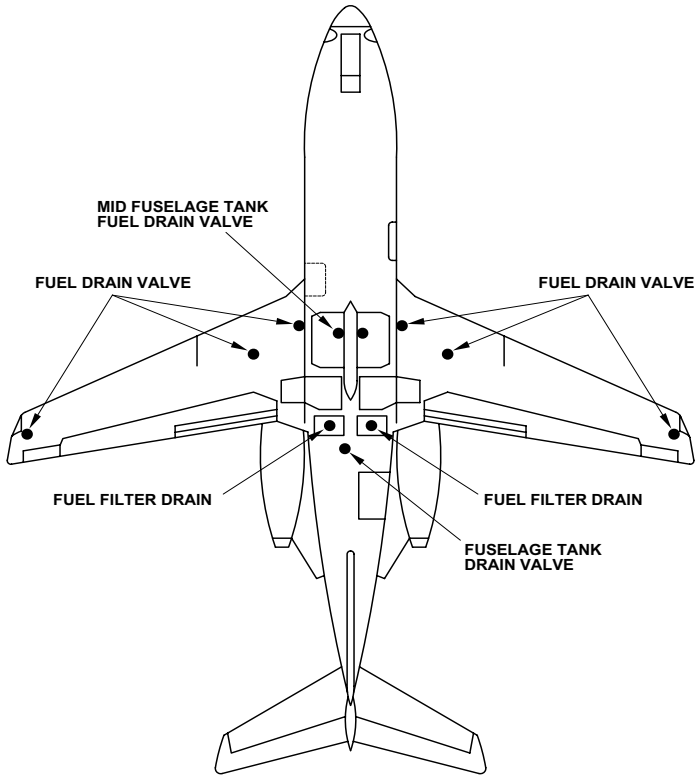
Fuel System


TRANSFER PRESSURE LOW
DEFUEL
CROSS FEED VALVE
SNIFFLE VALVE (PRESSURE & VACUUM RELIEF)
VENT SURGE TANK
FLAME ARRESTOR
FEED FUEL SOV
MOTIVE FUEL SHUTOFF VALVE
AFT FUSELAGE TANK
FEED FUEL
MOTIVE FLOW
VENT LINE
TRANSFER FUEL
DRAINED FUEL
STORED FUEL
VENT SURGE TANK
FILTER
ENGINE DRIVER PUMP
OVERBOARD DRAIN
AFT FILLER TANK
FUEL FILLER CAP
FUEL FILTER BYPASS
FUEL PRES. LOW
ENGINE DRIVER PUMP
FLAME ARRESTOR
SNIFFLE VALVE (PRES. & VACUUM RELIEF)
OVERBOARD DRAIN
DRAIN BOX
PRESSURIZED AIR
OVERBOARD VENT DRAINS
PRESSURIZED AIR
LEGEND
LOW LEVEL SWITCH
FLOW DIRECTION
ACCELERATION CHECK VALVE
FLAPPER VALVE
CHECK VALVE
SHUTOFF VALVE
ELECTRIC PUMP
JET PUMP
DEFUEL DRAIN VALVE
FILTER WITH BYPASS
FUEL PROBE
SUMP DRAIN
FUEL FILLER CAP
FLOAT CHECK VALVE
PRESSURE SWITCH
B4CRH-FU001i

Fuel System


LEGEND
LOW LEVEL SWITCH
FLOW DIRECTION
ACCELERATION CHECK VALVE
FLAPPER VALVE
CHECK VALVE
SHUTOFF VALVE
BOOST PUMP
JET PUMP
DEFUEL DRAIN VALVE
FILTER WITH BYPASS
FUEL PROBE
SUMP DRAIN
FUEL FILLER CAP
FLOAT CHECK VALVE
PRESSURE SWITCH
L WG TK OV PRESS
L FUEL FEED
L F XFR PRESS LO
L FUEL LEVEL LO
COLLECTOR TANK FUEL LEVEL LOW
R FUEL FEED
R F XFR PRESS LO
R FUEL LEVEL LO
R WG TK OV PRESS
BOOST PUMP
L AUTO R
OFF
ON
FUEL XFEED ON
FUEL FEED SHUTOFF VALVE
MOTIVE FUEL SHUTOFF VALVE
FUEL FEED SHUTOFF VALVE
MOTIVE FUEL SHUTOFF VALVE
RH ENG FIRE PUSH
R F/V OPEN
R H/V OPEN
R F/V CLOSE
R H/V CLOSE
JET PUMP
L NORM R
OFF
FUEL TRANS
L ON R
AUTO
RESET
JET PUMP
L NORM R
OFF
FUEL XFEED
L TANK NORM R TANK
LH RH
JET PUMP XFEED JET PUMP
L H/V OPEN
L F/V OPEN
L H/V CLOSE
L F/V CLOSE
LH ENG FIRE PUSH
L FUEL PRESS LO
L F FLTR BYPASS
R FUEL PRESS LO
R F FLTR BYPASS
B4CRH-FU002I

Fuel Drain Valves



B4CRH-FU003i

Fuel System

The fuel system provides an independent fuel supply for each engine and is designed for safe operation between sea level and 45,000 ft. within a temperature range of -40ºC (-40ºF) to 50°C (122ºF). All components in the fuel system are compatible with jet fuel grades Jet A, Jet A-1, JP-4, JP-5, JP-8, JP-8 +100 or RP-3 (Chinese). This system is not designed for use of any grade of avgas. Total usable fuel capacity is 733 US gallons.

Fuel Tanks

Fuel storage is provided in two independent wing tanks, two aux (forward) fuselage tanks, two mid-fuselage tanks, and one aft filler tank. A collector tank is internally mounted in the inboard portion of each wing tank. Refer to **Table 4E-A** for fuel tank quantities.

	WING TANKS (US GAL)	FUSELAGE TANKS (US GAL)	TOTAL (US GAL)
Unusable Fuel	7.16	1.19	8.35
Maximum Usable Fuel	427.28	305.81	733.09
Total Fuel Capacity	434.44	307.00	741.44

Table 4E-A; Fuel Storage Quantities

Fuel from the aft filler, aft fuselage, and auxiliary fuel tanks feed into the mid-fuselage tanks and is transferred to the wing tanks by fuel transfer pumps. Fuel from the wing tanks is gravity fed into the internally mounted collector tanks through one-way flapper valves installed in the bottom of the collector tanks. Additional fuel from the wing tanks is pumped into the collector tanks by two transfer jet pumps located in each collector tank. Fuel for the engines is provided from the collector tanks by the main jet pumps and boost pumps.

Fuel Feed

Each fuel feed system includes a main jet pump and a standby electric boost pump, both located in the collector tank at the inboard end of each wing tank. The pumps are interconnected by tubing and supply fuel under pressure to the engine and crossfeed lines. The outboard lower surfaces of the collector tank are equipped with flapper valves that allow fuel to gravity flow into the tank. The outboard upper surface of the collector tank is open to the wing tank to allow fuel to flow outboard during fuselage-to-wing transfer and to vent the collector tank. In addition to the gravity feed, two transfer jet pumps serve to transfer fuel from the wing into the collector tank. During normal operation, the main jet pump provides fuel feed to the engine with motive flow provided by the engine-driven fuel pump. The boost pump is used during engine starting, crossfeed, wing-to-collector-tank transfer and as a backup for the main jet pump. The boost pump is automatically energized during the starting procedure and, once the engine is started, is shut down by selecting the OFF position on start select switch.

A fuel shutoff valve is installed in the fuel feed line to stop fuel flow to the engine in case of engine fire or fuel leakage downstream of the valve.

Each fuel filter incorporates a pressure switch and a bypass valve. If the filter element becomes clogged, the filter pressure switch actuates and the L or R F FLTR BYPASS annunciator illuminates. If the pressure difference exceeds 2.3 PSI, the bypass valve opens and most of the fuel is supplied to the engine without passing through the filter element.

Boost Pump Switch

During normal operation the boost pump switches, placarded BOOST PUMP-ON-OFF-AUTO, are kept in the AUTO position. This provides automatic pump operation if pressure in the fuel feed line drops below 5 PSI, causing the L or R FUEL PRESS LO annunciator to illuminate. The boost pump will also automatically actuate to operate the forward transfer jet pump if fuel level in the collector tank drops below a prescribed level. This is indicated by illumination of the L or R FUEL FEED annunciator. Automatic actuation of the boost pump is indicated by illumination of the L or R BOOST PUMP operation light. When pressure in the feed line increases to 5 PSI or above, the LO FUEL PRESS annunciator will extinguish, but the pump will continue to operate until manually shut off. The switches are moved to the ON position during an in-flight air start, and as a backup to the automatic system.

Fuel Crossfeed

The crossfeed function is used primarily to equalize the fuel quantities in the left and right wing tanks by operating both engines from either of the tanks. If crossfeed becomes necessary, placing the crossfeed switch to the L or R TANK position will turn ON the boost pump on the side supplying fuel, open the crossfeed valve, and then close the motive fuel shutoff valve, securing the jet pump on the side being crossfed. Placing the crossfeed switch back to NORM will open the motive fuel shutoff valve, shut off the boost pump, and then close the crossfeed valve. The L or R BOOST PUMP light indicates operation of the boost pump. The FUEL X FEED light indicates that crossfeed has been selected and the crossfeed valve is open. The LH JET PUMP, RH JET PUMP, and X FEED lights illuminate when the respective valves are not yet in the position required by the crossfeed switch.

Positioning the crossfeed switch to the L (or R) TANK will initiate the following:

- The left (or right) boost pump begins to operate, assisting the respective main jet pump, and the L (or R) BOOST PUMP operation light illuminates.
- The fuel crossfeed valve begins to open and the X FEED operation light illuminates. When the crossfeed valve is fully open, the X FEED operation light extinguishes and the FUEL X FEED light illuminates.
- The RH (or LH) JET PUMP light illuminates when crossfeed is selected. About three seconds after the crossfeed valve fully opens, the opposite motive fuel shutoff valve starts closing. The JET PUMP light extinguishes once the motive fuel shutoff valve is closed.

When crossfeed is completed, positioning the crossfeed switch to NORM will initiate the following:

- The right (or left) motive fuel shutoff valve starts to open and the RH (or LH) JET PUMP light illuminates. The light extinguishes once the valve is open.
- About three seconds after crossfeed is deselected, the left (or R) boost pump ceases to operate and the L (or R) BOOST PUMP operation light extinguishes.
- When crossfeed is deselected, the FUEL X FEED operation light extinguishes and the X FEED light illuminates. About three seconds after crossfeed is deselected, the crossfeed valve starts closing. The X FEED light extinguishes once the crossfeed valve is closed.

Fuel Jet Pump Switch

During normal operation of the fuel system, the JET PUMP switch is positioned to NORM. The switch may be moved to OFF to check automatic boost pump operation on the ground and must be OFF during an in-flight engine re-light. When the switch is placed in the OFF position, the motive flow shutoff valve is closed and the boost pump is automatically actuated because the fuel feed line pressure will drop. This is confirmed by illumination of the L or R BOOST PUMP operation light.

CAUTION: If an engine fire occurs, the jet pump switch should be turned off after pushing the BOT 1 or 2 ARMED PUSH switch.

Fuel Transfer

Fuel in the mid-fuselage tanks is transferred to the right or left wing tanks by electric transfer pumps. During normal operation, the transfer pump switches, placarded FUEL TRANS-L-R-ON-AUTO-RESET is set to the AUTO position. With the switches in this position, fuel transfer is initiated when the generator is turned on after engine start. Fuel transfer is terminated automatically by the combination of a float switch in the mid-fuselage tank and a pressure switch in the transfer line. When fuel in the mid-fuselage tank reaches a level just above empty, the float switch is activated. The pump will continue to run until pressure in the transfer line drops below 1.3 PSI, at which time the pump shuts off.

The switch may be moved to the ON position to check transfer pump operation on the ground and as a backup to the automatic system. When the switch is moved to the ON position, an indicator light adjacent to the switch will illuminate, indicating that the pump is operating. If fuel is exhausted in the center fuselage tank the L or R F XFR PRESS LO annunciator will illuminate. The pilot must manually select AUTO to prevent the pump from running dry.

Fuel level in the wing is controlled by a pilot float valve in the outboard wing that operates a fill valve in the collector tank. When the fill valve closes, the transfer pump continues to run, but at a zero flow.

A wing over-pressure condition, caused by a malfunction of the wing fuel level control valves, will automatically shut down the transfer pump with the switches in the AUTO or ON positions, causing the L or R WNG TK OV PRESS annunciator to illuminate. The momentary RESET position may be used to reactivate the system.

Refueling

A filler port is provided on each wing upper surface and is covered by a cap assembly. The wing filler adapter assembly is provided with a flapper check valve to avoid fuel discharge in the event of cap seal failure. The aft filler tank filler port is located on the aft fuselage surface above the right engine pylon. This port is covered by a cap assembly and an access panel. The access panel is provided with a ground point for refueling and a provision that does not allow the panel to close if the aft filler tank filler cap is not completely secured.

Tank Vent

The vent system provides continuous ram air pressure to all tanks and the vent surge tank during flight. This allows the tank differential air pressure to remain within limits during maximum rate climbs or descents. Each fuel tank is vented separately through independent vent systems. The ram air scoop for each wing tank is located on the underside of the outboard wing area. The aft fuselage and filler tanks are vented to the vent surge tank that is, in turn, vented to the vent ports at the bottom of the fuselage.

Fuel Quantity Indicating System

Separate capacitance-type fuel quantity indicating systems are provided for the wing and fuselage tanks. The system for the wing tanks consists of four tank units in each wing with a dual pointer quantity indicator. The system for the fuselage tanks consists of four tank units and an indicator. The L or R FUEL LEVEL LO annunciator illuminates when approximately 225 lb. of fuel remain in a wing tank.