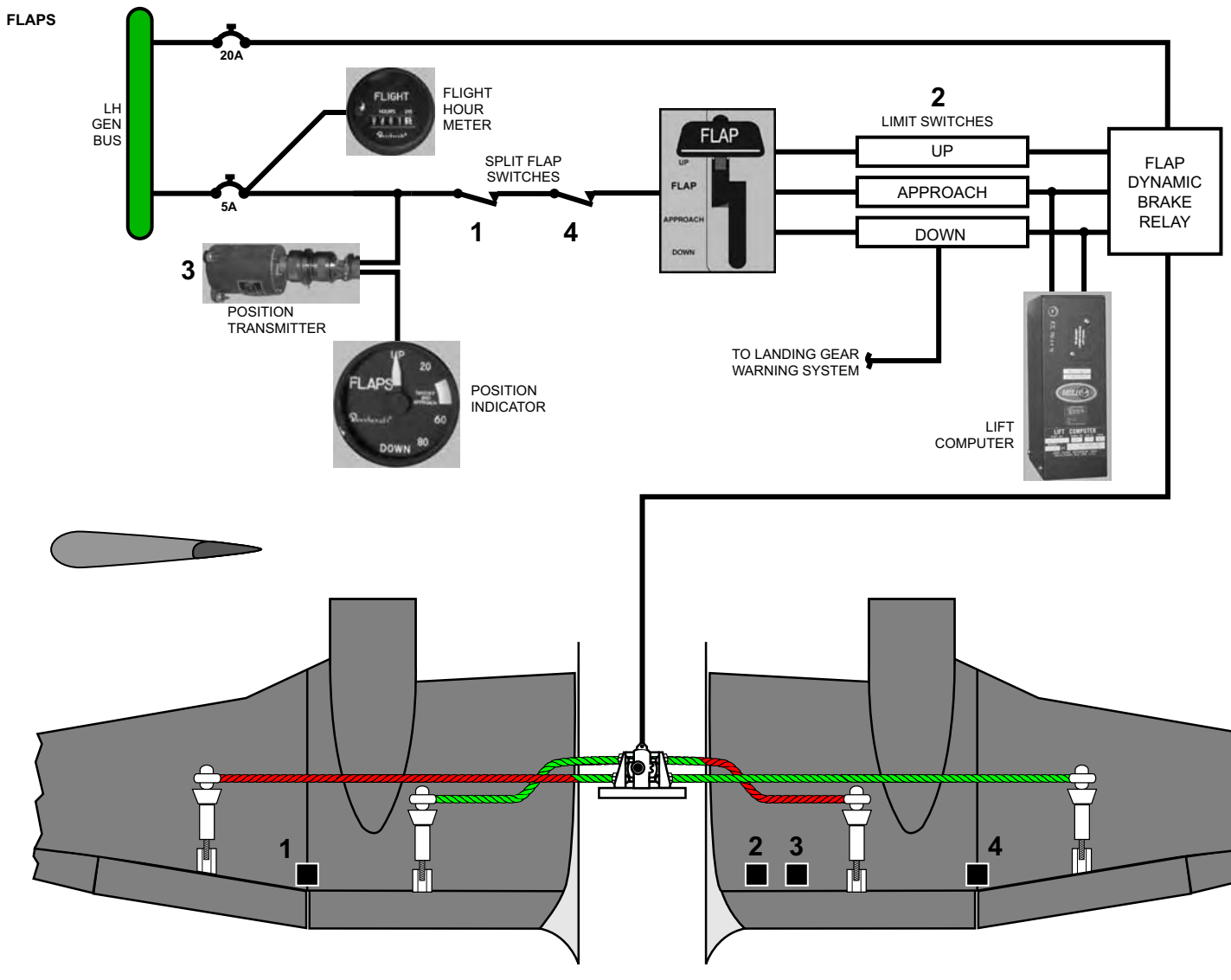
Flap System



B3CRH-FC001I

Flight Controls

Primary flight controls include the ailerons, elevators, and rudder. These control the aircraft through the pitch, roll, and yaw axes. Each of the primary flight controls has a mechanically operated trim system; the elevator trim system also has an electrically operated trim system. The flap system is the only secondary flight control system.

Related flight systems include the stall warning, rudder boost, and yaw damper systems.

Primary Flight Controls

Ailerons on the outboard trailing edge of each wing provide roll control mechanically through the control wheel or electrically through the autopilot servo. Rotating the control wheel left or right from neutral mechanically actuates the ailerons through a system of cables and bellcranks. Mechanical stops on the ailerons limit total movement to approximately 24 degrees up and 16 degrees down from neutral. The autopilot also actuates the ailerons through a servo connected to the aileron control circuit cables.

A trim tab on the left aileron provides lateral trim capability. Rotating the AILERON TAB knob left or right from the neutral or "0" position mechanically drives the trim tab up or down respectively. Rotating the aileron trim knob to the left drives the tab down for a left-wing-down movement; rotating it right produces the opposite effect.

The elevators on the trailing edge of the T-tail horizontal stabilizer provide pitch control. Pushing the control column fore and aft from neutral mechanically deflects the elevators down and up through cables and bellcranks. Stops limit total elevator movement to approximately 20 degrees up and 14 degrees down from neutral. An autopilot servo connected to the control cables also operates the elevators.

A mechanically or electrically operated pitch trim system drives the elevator trim tabs to reduce elevator control forces and trim the aircraft in the longitudinal axis. Rotating the ELEVATOR TAB wheel forward or aft from neutral mechanically drives the trim tab actuators. The jack-screw type actuators then extend or retract to move the elevator trim tabs in the necessary direction to pitch the nose up or down. With the ELEV TRIM switch in the ON position, the electric pitch trim system is activated. Actuating a set of TRIM switches toward the NOSE UP or NOSE DN position powers the electric trim tab actuator. The actuator's clutch then engages to connect the motor to the cable drum. The motor then operates the trim tab actuators through cables.

A bi-level, pushbutton, momentary-on trim disconnect switch is inboard of the dual-element thumb switch on the outboard grip of each control wheel. If an autopilot is installed, pressing the switch to the first level disconnects the autopilot and yaw damper system. Pressing the switch to the second level additionally disconnects the electric elevator-trim system. If no autopilot is installed, pressing the switch to the first level has no effect. The second level disconnects the elevator-trim system.

The rudder provides directional control of the aircraft about the vertical axis. A direct connect cable system from both sets of rudder pedals to the tail section drives the rudder. Deflecting a set of rudder pedals from neutral mechanically deflects the rudder to produce a yaw movement. Total rudder movement is approximately 25 degrees left or right from neutral.

Rotating the RUDDER TAB wheel left or right from neutral mechanically moves the rudder trim tab to reduce rudder pedal control forces. Total tab deflection is approximately 15 degrees left or right from neutral.

Rudder Boost and Yaw Damper

A rudder boost system positions the rudder to compensate for asymmetric engine power differences. If the engine torque drops below the preset value, the electric servo is activated and deflects the rudder proportionally to the torque loss. The rudder boost system is disabled if the RUDDER BOOST switch is selected to OFF and is momentarily interrupted when the DISC TRIM/AP/YD switch is pressed to the first level.

The yaw damper system is controlled through the autopilot; pressing the YAW ENG or the AP ENG a second time will engage the yaw damper system.

Flaps

Each wing contains two flaps on the trailing edge inboard of the ailerons. With flaps extended, stall speed decreases approximately 7 to 9 knots.

Selection of a flap position on the FLAP handle controls travel of the flaps by powering the flap motor through limit switches and a flap motor relay. The flap motor drives a gearbox connected to four flexible driveshafts that, in turn, connect to a jackscrew actuator at each flap. To prevent overtravel, the flap motor has a dynamic braking system with two sets of motor windings.

A safety mechanism interrupts power if 3 to 6 degrees split flap situation occurs.

The landing gear warning system provides an aural and visual warning of improper flight configurations. With the FLAP handle in UP, APPROACH, or DOWN, retarding the power levers below about 84-86% N_1 RPM setting with the landing gear not down, and locked, sounds the gear warning horn and illuminates the landing gear lever in-transit light. The landing gear warning horn may be silenced by the buttons located either next to the landing gear lever and/or on the left throttle assembly and while the flaps are selected in the UP or APPROACH position. Advancing the power levers or extending the landing gear cancels the warning completely. With flaps down, the horn cannot be silenced by advancing the power levers or by pressing the horn silence button.

Stall Warning System

The stall warning system provides an audible warning to notify the crew of an impending stall.

With weight-off-wheels, an electrically heated lift transducer measures the aircraft's angle-of-attack (AOA). The system's lift computer then processes the transducer's inputs and modifies it based on flap setting.

If a stall is imminent, the lift transducer triggers and the warning horn sounds.

With weight-on-wheels, placing the STALL WARNING TEST switch in the test position magnetically deflects the lift transducer to the pre-stall position. If the system is working normally, the stall warning horn sounds.

NOTE: Stall Warning system may be unreliable during operations in icing conditions with accumulation of ice on airframe surfaces.

Flight Controls
Flap System

Power Source	L Generator bus – electric motor/control
Control	FLAP handle
Monitor	FLAP indicator
Protection	Circuit breakers FLAP CONTROL (5A) FLAP MOTOR (20A) Split flap protection limit switches