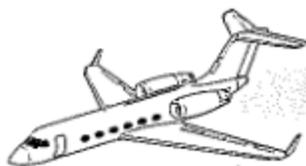


Figure 27-37. Flap Control System Block Diagram



Central Gearbox

The central gearbox is mounted on the forward upper end of the torque box in the main wheel well. The gearbox has an input shaft and four output shafts. The input shaft is driven by the hydraulic motor. The hydraulic motor is a fixed displacement motor operating at 6,000 rpm. This speed is reduced in the central gearbox at a ratio of 8.22 to 1. Torque is transmitted at a speed of 730 rpm to the spanwise torque shafts to drive the flaps and to drive the horizontal stabilizer. The fourth output is to the flap followup switch assembly and the position transmitter.

Flap Control Handle

The flap control handle is located on the right side of the center pedestal. It moves vertically into four detented positions: UP (0°), 10°, TAKEOFF/APPROACH (20°) and DOWN (39°).

The emergency flap control handle is located on the copilot's side console. It is mechanically linked to the flap selector valve and is used as a manual override in the event of an electrical malfunction in the flap control valve. The handle moves vertically through three detented positions: UP, DOWN, and NEUTRAL. To operate the flaps with the emergency handle, move it in the desired direction and when the flaps reach the desired position return the handle to neutral.

Flap Selector Valve

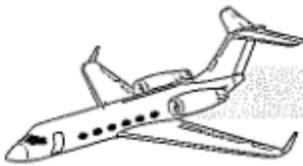
The flap selector valve is located in the nose wheel well, right side. It is a dual solenoid-operated valve. Solenoid "A" is energized for flaps up and solenoid "B" is energized for flaps down. The two positions provide reversing hydraulic flow to the hydraulic motor for flap operation. The automatic stopping feature of the flaps is controlled by the flap followup switch assembly. When the flaps reach the desired position, one of the followup switches opens the electrical circuit to de-energize the respective solenoid valve. This results in the hydraulic motor stopping and the

flaps being held in the desired position. If the selector valve solenoids fail, the emergency handle can be used to operate the valve.

Flap Shutoff Valve

The flap shutoff valve is located in the nose wheel well forward of the selector valve. It is a single solenoid valve that must be energized open. When energized, it will allow hydraulic fluid to the flap selector valve. It is energized whenever the flap control handle is moved. If the flap control circuit breaker should blow due to an electrical failure in the normal flap control circuit, the valve can be energized through a separate circuit and the emergency flap control handle can be used to move the flaps. Should a flap asymmetry occur during normal or emergency operation, the shutoff valve will be de-energized to prevent flap operation.

NOTES



ELECTRICAL OPERATION

Power for the flap control system is supplied by the FLAP CONT circuit breaker powered from the ESS DC bus. Additionally, the MANUAL FLAP CONT circuit breaker is powered through an integral switch in the FLAP CONT circuit breaker whenever it opens.

The control system consists of four switches actuated by the flap control handle. Additional control comes from the flap followup switch assembly. The assembly contains six flap position switches and five warning switches as well as control switches for other aircraft systems. These switches open and close as the flaps cycle through their range of 0 to 39°. As the flaps reach a selected position, the drive cam opens the particular switch, breaking the circuit to the flap selector valve and halting flap movement. Of the six flap position switches, three control retraction and three control extension.

UP (S1)—Retract

10° UP (S3)—Retract

10° Down (S4)—Extend

20° UP (S5)—Retract

20° DOWN (S6)—Extend

DOWN (S2)—Extend

The remaining switches in the assembly also open and close through the drive cam action in correspondence to flap position to allow certain circuits to be completed.

Landing Gear Warning Horn (S7)—Flaps equal to or greater than 22°

Takeoff Alarm (S8)—Flaps full up or down

Hydraulic Control (S9), not used

Speedbrake/Flap Alarm (S10)—Flaps any position except up

Flap/Stab Warning (S11)—Flaps full up, stab not at $1 \pm 1/4^\circ$

AFGCS (S12)—Flaps any position except up, not used

NOTES