FLIGHT CONTROLS

GENERAL

The aircraft has conventional three-axis controls. The elevator and ailerons are hydraulically powered. Rudder control is assisted by rudder bias system if asymmetric thrust conditions exists.

CONTROL WHEEL

A yellow autopilot disconnect switch (AP/SP DISC), installed on the outboard handle of each control wheel, allows immediate autopilot disengagement. (Figure 5-30) It will also disconnect the yaw damper if it is pressed with the landing gear down.
A vertical synchronization (VERT SYNCH) switch, on the outboard forward side of each control wheel handle, vertically synchronize the flight director references. The VERT SYNCH switches allow the autopilot to synchronize to the current flight reference.

ELEVATOR

The elevator has a dual power control system. The Control column movement is transferred through a series of mechanical linkages such as closed loop cable system, bellcranks and push-pull rods to control the input lever of hydraulic servo actuator which, in turn, moves the control surface. An artificial feel system, comprised of spring, is connected to each control column. An additional q-feel unit is included in the control loop for high speeds to change the control forces according to aircraft speed.
Pilot and copilot controls are interconnected through a disconnect device. When pulling PITCH lever in pedestal left side, Pilot control column operates the left elevator and the copilot control column operates the right elevator. Rotate lever to keep elevators disconnected.
Stick shaker and stick pusher are incorporated for stall protection. They are activated by flight control computer when the aircraft is approaching stall by shaking and than pushing the control column forward.
Autopilot servo is mechanically connected to the elevator control system.

AILERONS

The aileron has a dual power control system. The control column movement is transferred through a series of mechanical linkages such as closed loop cable system, bellcranks and push-pull rods to control the input lever of hydraulic servo actuators which moves the ailerons. An artificial feel unit is connected through aileron trim to the cockpit controls at the wing center section.
Pilot and copilot controls are interconnected through a disconnect device. When pulling ROLL lever in pedestal right side, pilot control column operates the left aileron and the copilot control column operates the right aileron. Rotate lever to keep ailerons disconnected.
To prevent high control forces during complete hydraulic system failure, a solenoid operated lock prevents ailerons disconnect.
Aileron trim is a feel trim unit with limited authority (5° of the 15° aileron travel).
Autopilot servo is mechanically connected to the aileron control system at the pilot side.

RUDDER

The rudder has a manual single loop control. Pilot and copilot pedals are interconnected. The pilot or copilot input at pedal is transferred through bellcranks, push-pull rods and torque tubes which are routed through the right side of the fuselage, to move the rudder surface. A geared tab is used to reduce the control forces. The same tab is used for trimming.
Position of the rudder pedals can be adjusted using a hand operated crank.
Rudder bias actuator is connected in parallel to the control system. It is actuated by the differential bleed pressure acting on the faces of the rudder bias actuator piston during asymmetric thrust condition.
A gust lock unit is installed in cockpit to lock the rudder control system. To release the gust lock, a plunger is activated by the gust lock lever in cockpit pedestal. If the gust lock lever is disconnected from the plunger, a spring acts always to keep the gust lock plunger unlocked. The gust lock is guarded against inadvertent operation.
Yaw damper servo is mechanically connected to the rudder system.

FLIGHT CONTROLS MESSAGES

Caution Messages

AILERON FAIL - Mechanical failure of one or both aileron servoactuators

ELEVATOR FAIL - Mechanical failure of one or both elevator servoactuators

ELEVATOR FEEL FAIL - Elevator Q-feel (artificial feel) data failure (ADC or computer malfunction)

A/P PITCH TRIM - Autopilot pitch trim has failed

RUDDER BIAS OFF - Rudder bias system is off