

HYDRAULIC SYSTEM

GENERAL

The hydraulic system powers the ailerons, elevator, elevator feel, stick pusher, air brakes, krueger flaps, landing gear, wheel brakes, nosewheel steering and thrust reversers.

Two independent and separate systems are powered from each engine. The right system is backed up by an electrically powered pump.

The ailerons and elevators are powered from both systems.

The right system powers the following systems: elevator feel, stick pusher, krueger flaps, flight (inboard) air brakes, landing gear, nosewheel steering, wheel brakes (including parking), right thrust reverser.

The left system powers the following systems: ground (outboard) air brakes, emergency brakes, left thrust reverser.

During normal operation, hydraulic power is generated by engine driven, variable displacement, constant pressure (3000 psi) pumps.

Alternate hydraulic power (during right engine or right hydraulic pump failure) is supplied by an electric pump. This pump is connected to the right system and powers all systems normally powered by this system.

Emergency landing gear extension is achieved by a stored pneumatic pressure.

Emergency wheel brakes backup power is provided by an accumulator.

HYDRAULIC POWER SUBSYSTEMS

Hydraulic Pumps

One engine-driven pump is utilized in each system for normal power. These are self-regulating piston-type pumps, each driven by the accessory gearbox of the engine. The pumps supply a regulated pressure ranging from 3,000 psi for no-flow condition to 2,850 psi for maximum flow. The maximum flow of each pump is 8.5 GPM.

A 28 VDC electric pump, supplements the right hydraulic system under high demand situations. The electric pump has a maximum flow of 2.9 GPM and operates under the following conditions:

- Either main landing gear not locked up with one thrust lever set beyond MAX CLIMB;
- Low pressure in the right hydraulic system (below 1200 psi).

Hydraulic Reservoirs

Each system has one hydraulic fluid reservoir, for absorbing fluid volume changes and for pump inlet pressurization. Each reservoir is mounted on a tray that collects fluid leaks overboard during filling. The reservoirs are pressurized to 30 psi from engines and APU.

Hydraulic Fluid Filters

The filters maintain fluid cleanliness to prevent contamination of sensitive components. Fluid contamination is controlled by high pressure filters at the pump outlets and by low pressure filters with bypass at the return lines.

FLIGHT CONTROL SERVOACTUATORS

The ailerons and elevators are powered by two pairs of servoactuators with compensators. The elevators system also includes an artificial (q) feel servoactuator.

Each servoactuator pair consists of two independent and identical cylinders, mounted side by side and operate in parallel. Each is supplied from a different hydraulic system. The actuators are attached to the control surface through a double linkage. The right hydraulic system supplies the inboard cylinders and the left hydraulic system supplies the outboard cylinders.

One hydraulic system only is sufficient for safe maneuvering of the aircraft. Even with total loss of hydraulic power, it is possible to fly the aircraft manually.

The q-feel actuator is a variable ratio lever between the rear sector of the pilots control loop and the variable artificial feel spring box of the elevator system.

The q-feel system comes on at 150 KIAS and causes heavier pitch force in proportion to airspeed increase.

STICK PUSHER

The stick pusher actuator is part of a stall prevention system. It is maintained retracted by the right hydraulic system pressure. A shutoff valve prevents inadvertent operation.

KRUEGER FLAPS

The krueger flaps actuators are powered from the right hydraulic system.

Each flap is operated by one actuator with internal locks for both extended and retracted positions.

AIR BRAKES

The air brake system consists of eight actuators, four inboard and four outboard. The inboard actuators are powered from the right hydraulic system and the outboard actuators are powered from the left hydraulic system.

The air brakes (inboard) extend simultaneously and symmetrically, the control circuit will cause retraction if extension is not simultaneous and symmetrical.

All eight actuators are double acting, single rod cylinders, locked in retracted position by internal mechanical locks.

Gulfstream G200 - Hydraulic System

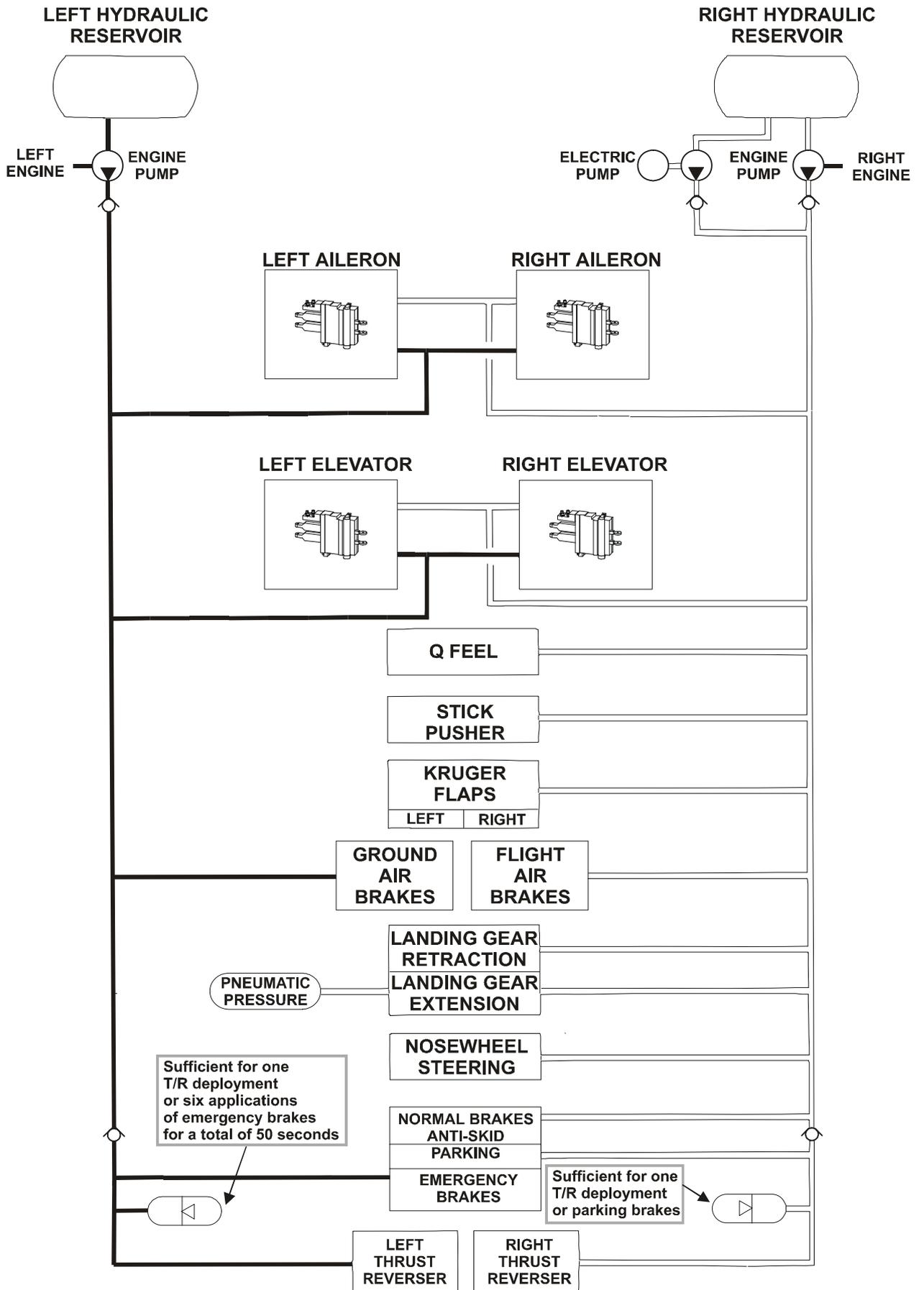


Figure 5-10. Hydraulic Power Systems-Schematic

HYDRAULIC SYSTEM CONTROLS AND INDICATORS

AUX HYD PUMP switch - Controls operation of right hydraulic system electric pump according to the following positions:

OFF - Pump is off

AUTO - Normal switch position; the pump comes on whenever: one landing gear not locked up and one thrust lever set beyond MAX CLIMB or low pressure in right hydraulic system.

Pump motor thermal protection is installed. If the thermal protection is activated due to high motor load, switching to OVRRD position restores pump operation. It is recommended to switch to OVRRD position for short-duration operations such as landing gear extension and brakes operation for landing

OVRRD - Pump is activated regardless of the normal AUTO position determinants.

EICAS Indications

Hydraulic Pressure (left/right) - Indicates hydraulic system pressure.
Normal pressure is 2700 to 3250 psi.

Landing Gear NITROGEN bottle - Indicates pressure of emergency gear nitrogen bottle (3000 psi).

BRAKE ACCUMULATOR - Indicates pressure of brake accumulator (1250 psi precharge pressure and 3000 psi when fully charged). Fully charged accumulator permits 6 cycles of EMERG brakes or one left T/R deployment.

Caution Messages

HYD LEVEL LOW (L/R) - Main Hydraulic tank fluid level is low

HYD LEVEL LOW (L/R) - The respective hydraulic system temperature above limits

AUX HYD PRESS LOW - Auxiliary hydraulic pressure is low when the pump is on, or AUX HYD PUMP switch is in OFF position.

AUX HYD PUMP ON - Auxiliary hydraulic pump is operating (comes on when right hydraulic system pressure drops or AUX HYD PUMP switch in OVRRD position)

HYD TANK PRESS LOW - Hydraulic tank pressurization is low (either system)

HYD PUMP PRES LOW (L/R) - Hydraulic pump failure

HYD PUMP PRESS HI (L/R) - Hydraulic pressure above 3500 psi

Status Messages

HYD PRESS FILTER (L/R or AUX) - The respective hydraulic pump filter is clogged

HYD QTY OVER FILL (L/R) - Hydraulic fluid quantity exceeds 105%. Comes on on ground only

HYD QTY REFILL (L/R) - Hydraulic fluid quantity is less than 90%. Comes on on ground only

HYD RTN FILTER (L/R) - Hydraulic return line filter is clogged (pop-out pin is extended)

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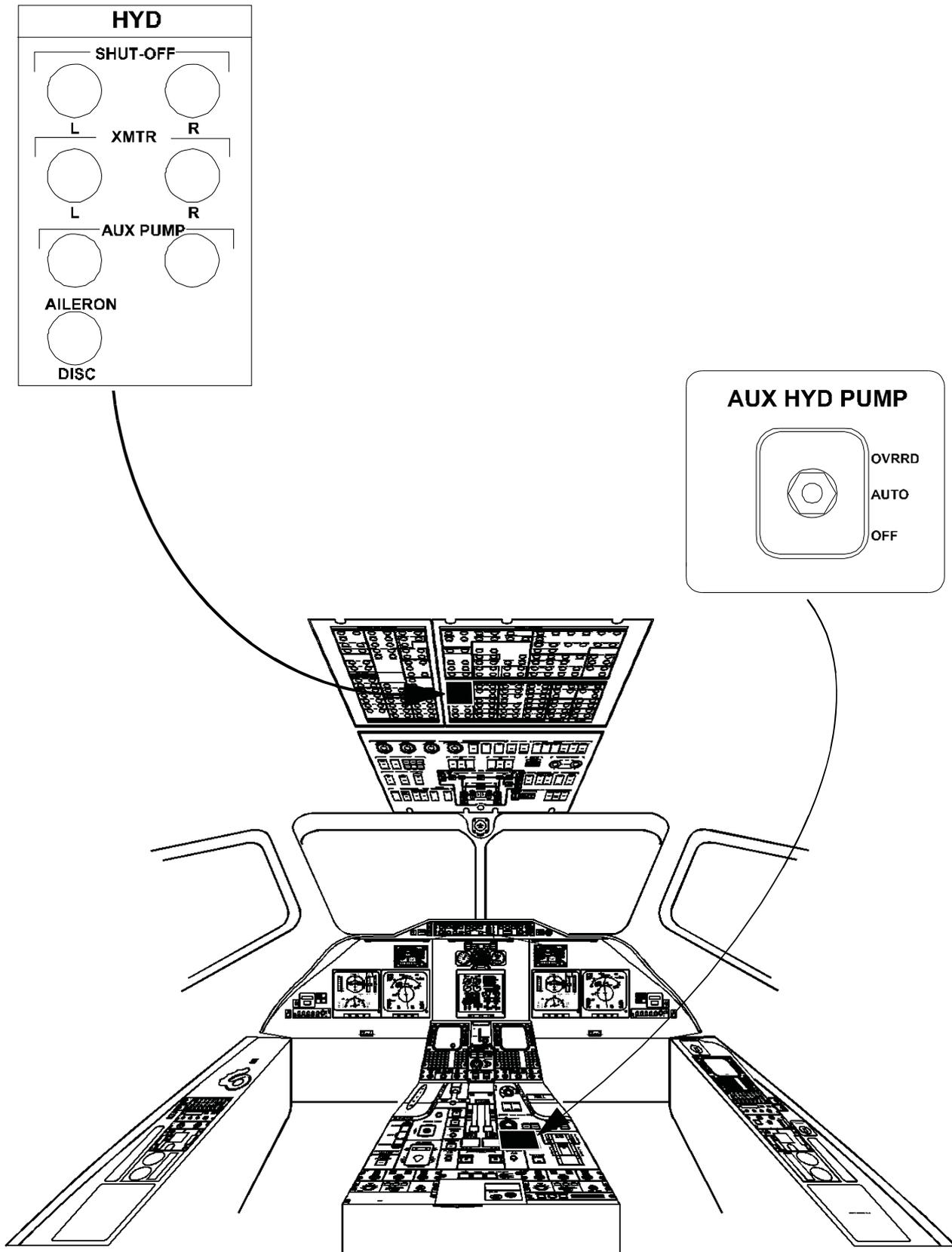


Figure 5-11. Hydraulic System Controls