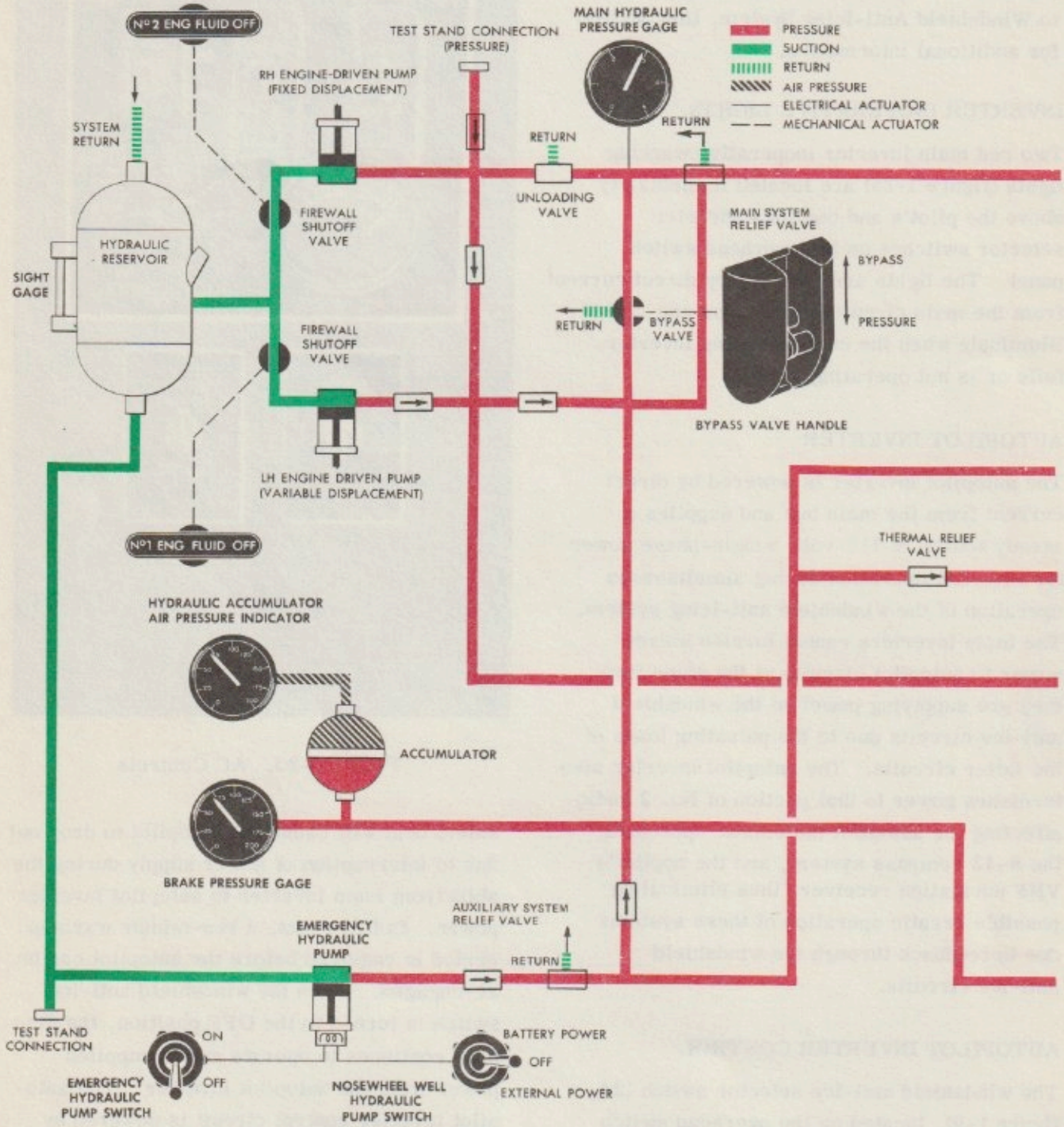


Figure 1-26 (Sheet 1 of 2). Hydraulic Power Supply System (C-131F Type Aircraft)

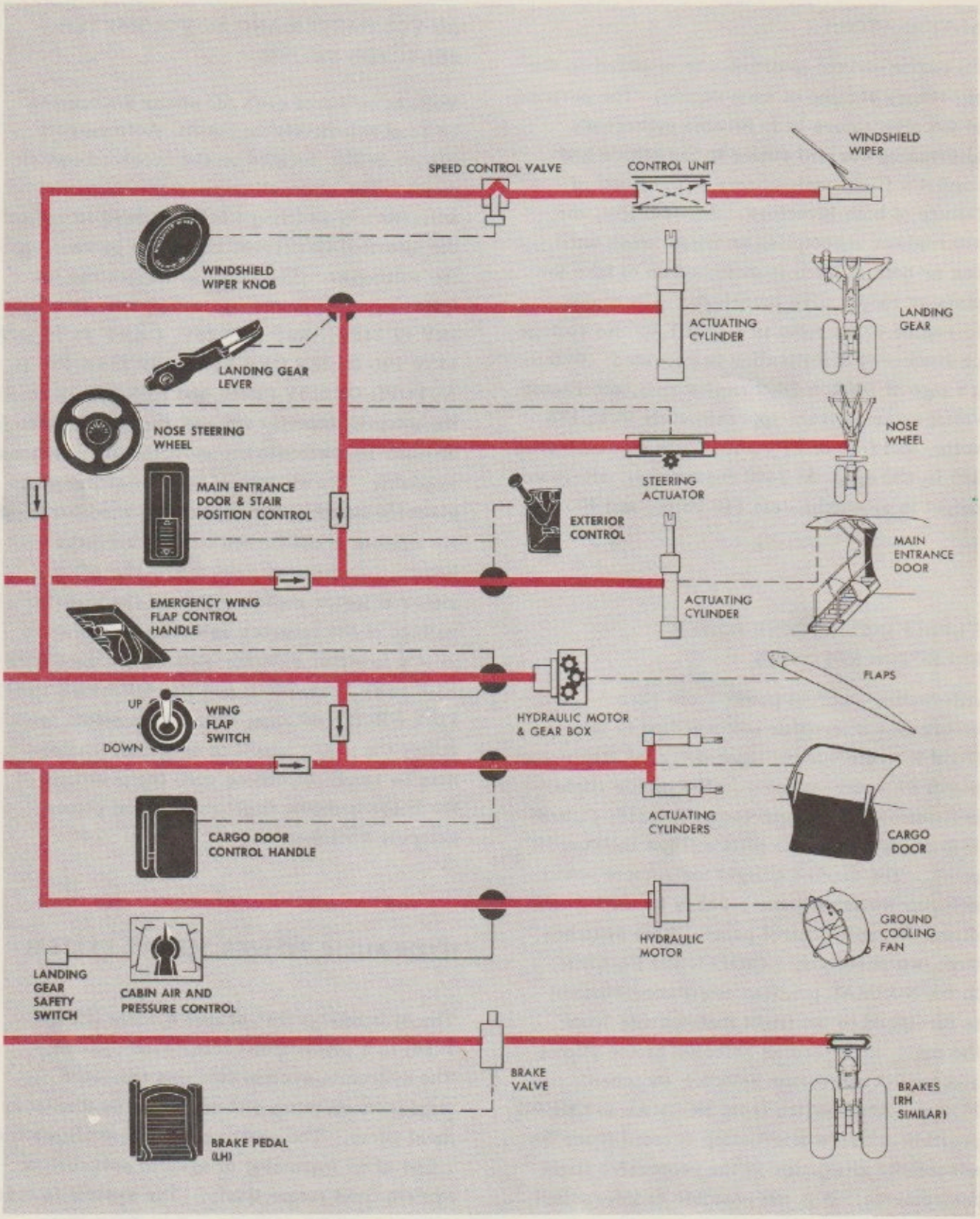


Figure 1-26 (Sheet 2 of 2). Hydraulic Power Supply System (C-131F Type Aircraft)

### ALTERNATORS

An engine-driven alternator is mounted on the accessory section of each engine. The purpose of the alternators is to furnish emergency alternating current power to the pilot's and copilot's flight instruments in the event of failure of both inverters. Accordingly, the alternators accomplish no useful work until one or both of them is switched on to take the place of inoperative inverters. Alternator-to-engine drive ratio is 1.4 to 1.0. No voltage or frequency stabilization is provided. Within a range of 2000 to 2800 engine rpm, alternator voltage varies from approximately 94 to 138 volts, and frequency varies from approximately 325 to 480 cps. At 2460 engine rpm, alternator output is approximately 115 volts, and 400 cps.

### FLIGHT INSTRUMENT POWER SELECTOR SWITCHES

Alternating-current power from each emergency alternator is connected to the flight instruments by separate flight instrument power selector switches. The pilot's flight instrument power selector switch (16, figure 1-8) is located on the pilot's flight instrument panel. The copilot's flight instrument power selector switch (figure 1-25) is located on the direct-current control panel. Both switches have two positions, NORMAL and EMERG. In the NORMAL position alternating current is furnished to the flight instruments from the main inverters as selected by the pilot's and copilot's inverter selector switches. Moving either switch from NORMAL to EMERG position delivers alternating current from the associated alternator to the respective flight instruments. It is not possible to interselect power output from the left engine alternator to the copilot's flight instruments or vice versa.

### AC VOLTMETER AND AC VOLTMETER SELECTOR SWITCH

Voltage output of each AC power source can be read selectively on the AC voltmeter (figure 1-25), located on the overhead switch panel. The alternating-current voltmeter selector switch (figure 1-25) is used to select the alternating-current voltage to be read on the voltmeter. The selector switch has the following eight positions: OFF, INV #1 115V, INV #2 115V, INST BUS 26V, CAPT FLT INST 115V PH-B, 1ST OFF FLT INST 115V PH-B, AUTOPILOT 115V PH-B, and APS-42. To read the autopilot inverter voltage, turn the windshield and anti-ice switch to any one of the five positions available. The windshield anti-ice switch energizes the autopilot inverter. If the windshield anti-ice system is not turned on, the autopilot inverter position as selected on the AC voltmeter selector switch will read the inverter voltage of the inverter as selected by the copilot's inverter selector switch. In the CAPT FLT INST 115V PH-B and 1ST OFF FLT INST 115V PH-B positions, the voltage output from either the phase adapters or the alternators may be read, depending upon the positions of the corresponding flight instrument power selector switches.

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## HYDRAULIC POWER SUPPLY SYSTEM

The hydraulic power supply system (figure 1-26) is a semi-open center-type system. The hydraulic system contains one fixed displacement pump and one variable displacement pump. The semi-open system allows for relief of or bypassing of system pressure or system fluid respectively. The system is thus relieved of high pressure when there is no demand for it. This system is in the C-131F

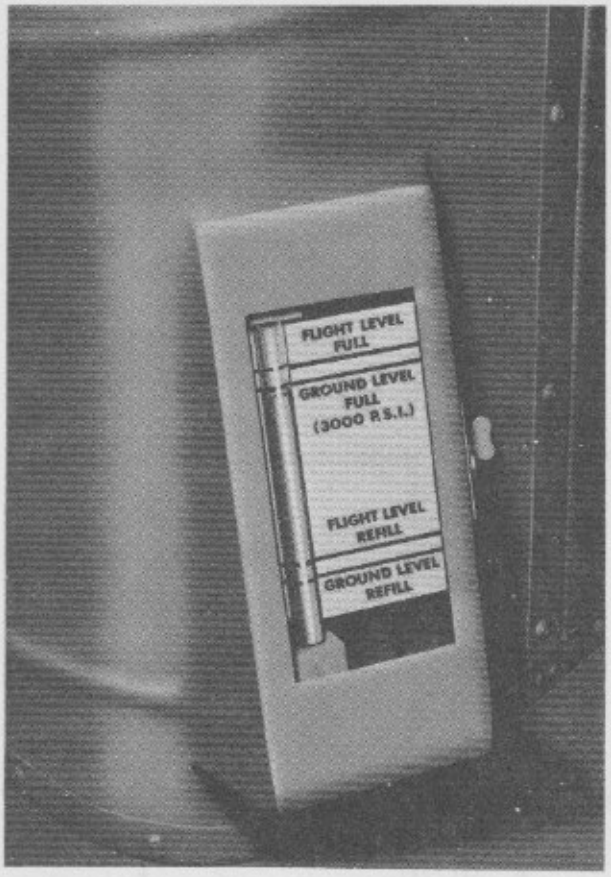


Figure 1-27. Hydraulic Reservoir Sight Gage

models. The C-131G system (figure 1-29) has two variable-delivery engine-driven pumps, one on each engine, which supply pressure for normal operation of the hydraulic system. These pumps are an axial-piston type with integral pressure regulation and flow control. Demands on the system are met automatically by varying the output flow of the pumps. The entire hydraulic system can be operated under full pressure when required or part of the system may be inactivated by operation of a bypass (depressurization) valve. An accumulator is provided to store pressure for limited brake or system operation. An electrically operated emergency hydraulic pump provides pressure for the entire system in an emergency and a pneumatic system provides limited emergency brake operation. The emergency hydraulic pump may also be used to provide hydraulic pressure for ground operation when the engines are not running. The hydraulic reservoir (figure 1-26), located aft of the pilot's seat, is provided with a sight gage and filler fitting. Test stand connections for gound operation and checking of the system are provided on a panel at the aft side of the nose landing gear well. The accumulator must be charged with air on the ground to assure reserve pressure in the system. Refer to figure 1-26 for hydraulically operated equipment.

## Hydraulic Fluid Specification

Refer to figure 1-63.

## Hydraulic Reservoir and Sight Gage

The hydraulic reservoir (figure 1-27) is installed in a housing located above the floor level on the left side of the flight compartment just aft of the pilot's seat. A sight gage on the reservoir can be read through a window in the forward side of the housing. The reservoir

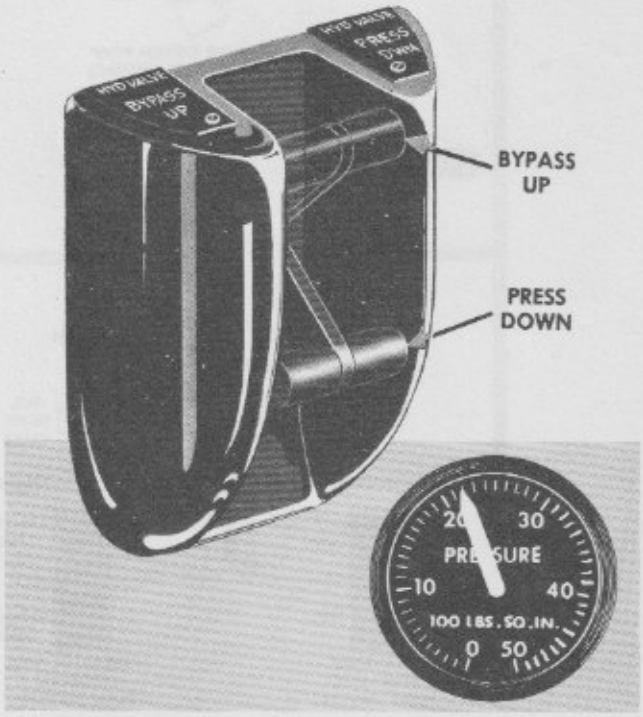


Figure 1-28. Hydraulic Pressure Bypass Handle and Hydraulic Pressure Gage

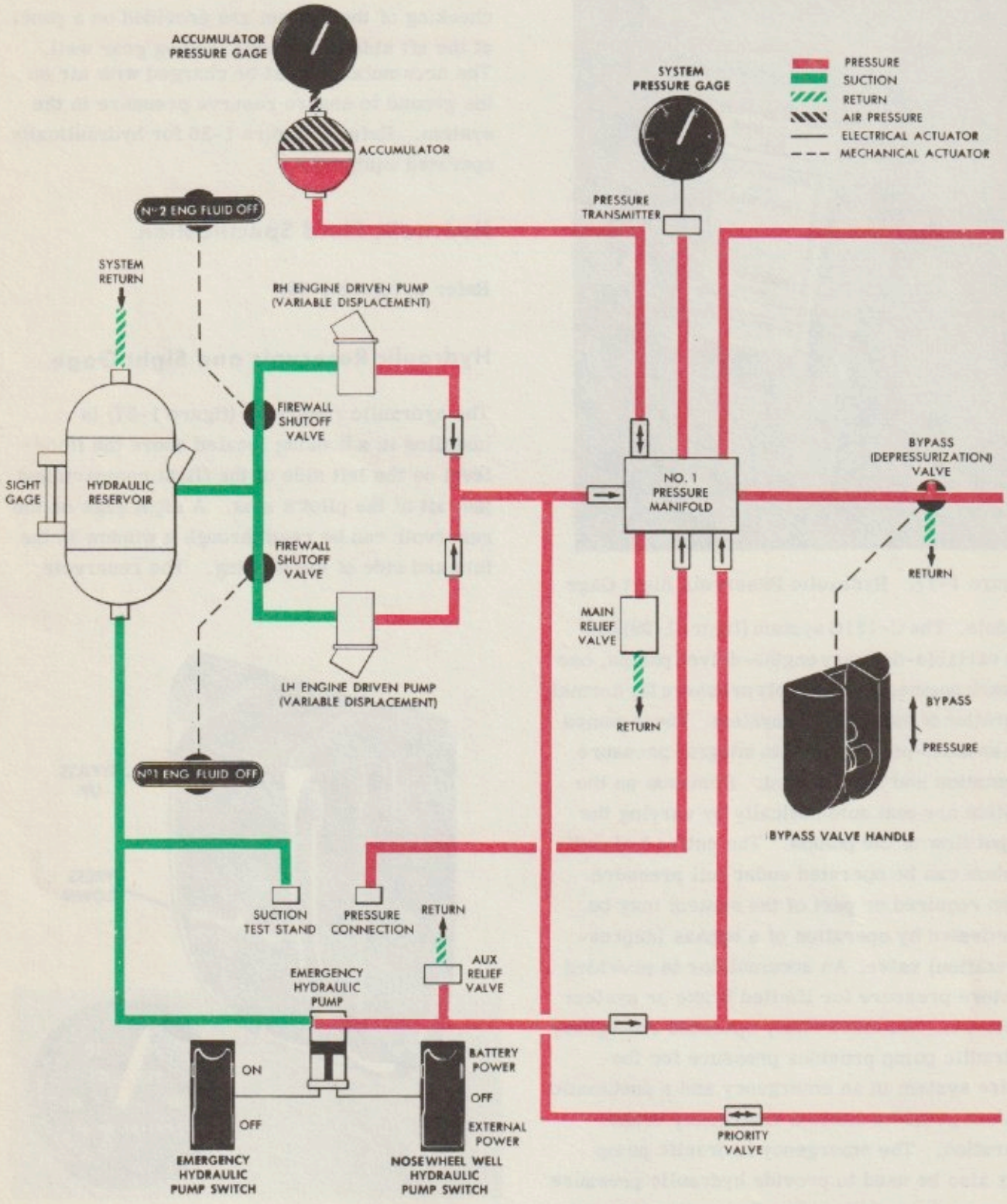


Figure 1-29(Sheet 1 of 2). Hydraulic Power Supply System (C-131G Type Aircraft)

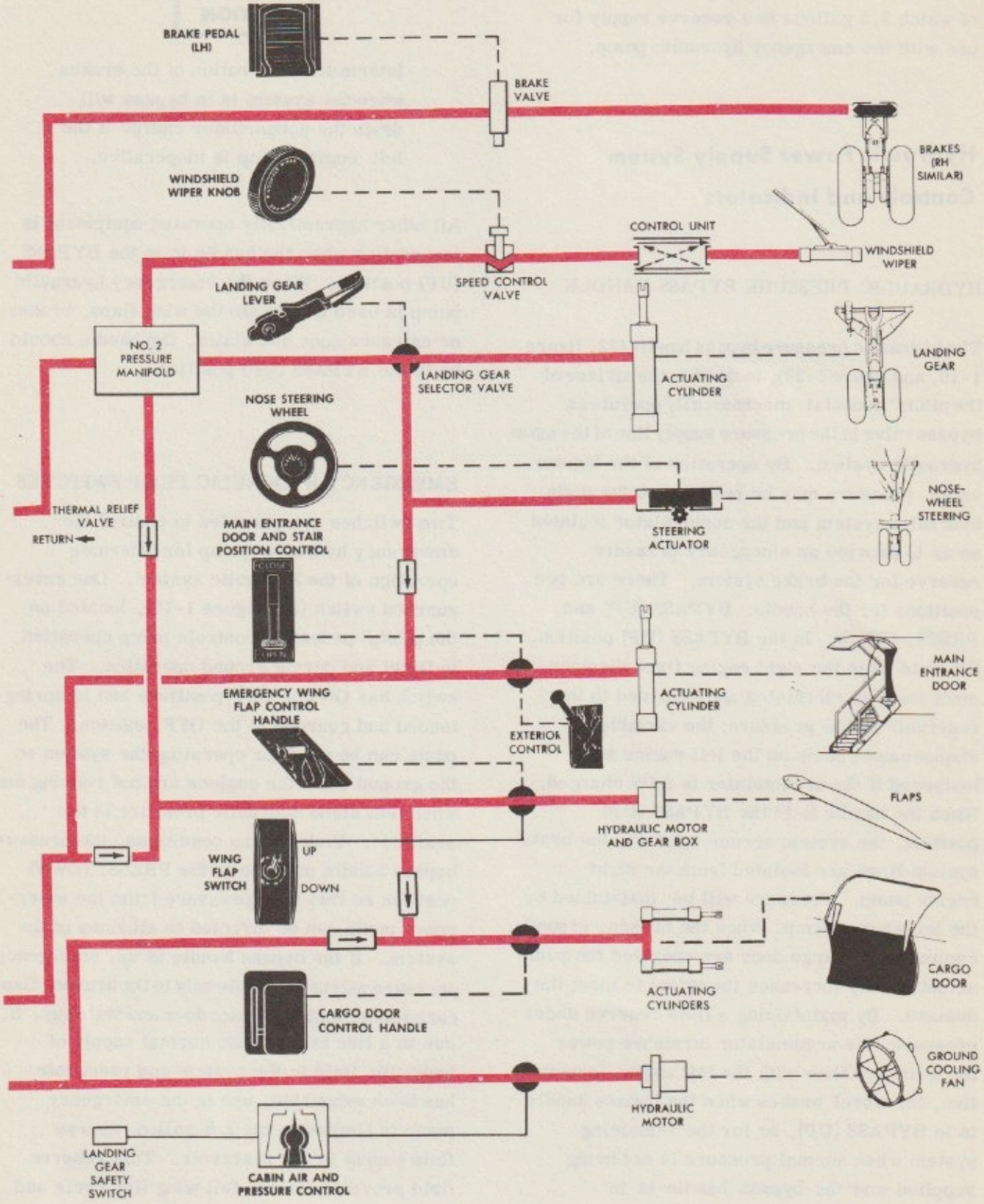


Figure 1-29 (Sheet 2 of 2). Hydraulic Power Sypply System (C-131G Type Aircraft)

has a usable fluid capacity of 6.0 US. gallons, of which 2.5 gallons is a reserve supply for use with the emergency hydraulic pump.

## Hydraulic Power Supply System Controls and Indicators

### HYDRAULIC PRESSURE BYPASS HANDLE

The hydraulic pressure bypass handle (22, figure 1-10, and figure 1-28), located on the aft face of the pilots' pedestal, mechanically operates a bypass valve in the pressure supply line of the main hydraulic system. By operation of the bypass valve, pressure may be relieved on the main hydraulic system and the accumulator isolated so as to provide an emergency pressure reserve for the brake system. There are two positions for the handle: BYPASS (UP) and PRESS. (DWN). In the BYPASS (UP) position, the fluid from the right engine fixed displacement pump is circulated and returned to the reservoir at low pressure; the variable displacement pump on the left engine is feathered if the accumulator is fully charged. When the handle is in the BYPASS (UP) position, the system accumulator and the brake system lines are isolated from the right engine pump. Pressure will be maintained by the left engine pump. When the brakes, ground cooling fan or cargo door are operated the pump automatically increases its output to meet the demand. By maintaining a fluid reserve under pressure, the accumulator furnishes power for a limited time with the left engine inoperative, for wheel brakes when the bypass handle is in BYPASS (UP), or for the remaining system when normal pressure is not being supplied and the bypass handle is in PRESS. (DWN).

**CAUTION**

Intermittent operation of the brakes when the system is in bypass will drain the accumulator charge if the left engine pump is inoperative.

All other hydraulically operated equipment is inoperative when the handle is in the BYPASS (UP) position. When the emergency hydraulic pump is used to operate the wing flaps, brakes, or entrance door and stairs, the handle should be in the BYPASS (UP) position.

### EMERGENCY HYDRAULIC PUMP SWITCHES

Two switches are provided to control the emergency hydraulic pump for alternate operation of the hydraulic system. One cover-guarded switch (26, figure 1-10), located on the pilots' pedestal, controls pump operation in flight and during ground operation. The switch has ON and OFF positions and is spring-loaded and guarded in the OFF position. The pump can be used for operating the system on the ground when the engines are not running and when test stand hydraulic pressure is not available. Under these conditions, the pressure bypass handle must be in the PRESS. (DWN) position so that fluid pressure from the emergency pump can be directed to all lines of the system. If the bypass handle is up, emergency pressure will be available only to the brakes, flaps, cargo door, main entrance door and stairway. If, due to a line failure, the normal supply of hydraulic fluid in the system and reservoir has been exhausted, use of the emergency pump is limited to the 2.5-gallon reserve fluid supply in the reservoir. This reserve fluid provides for one full wing flap cycle and approximately 15 normal brake applications.

**NOTE**

The landing gear will extend and lock without the use of hydraulic pressure.

A second cover-guarded switch (figure 1-38) is located in the nosewheel junction box for ground operation only and is used primarily to supply hydraulic power for operating the main entrance door from outside. The switch has three positions: BAT PWR, EXT PWR, and is spring-loaded to the OFF position, thus permitting operation of the pump regardless of the position of the battery switch in the flight compartment. When the switch is held in the BAT PWR or EXT PWR position, power is supplied directly to the pump motor through the aircraft's direct-current electrical system. This switch overrides the battery switch; therefore, any equipment left in the ON position that is driven by direct current from the main DC bus will operate when the emergency hydraulic pump switch in the nosewheel well is actuated.

**CAUTION**

To prevent overheating, avoid operating the emergency hydraulic pump continuously for more than five minutes. Allow the pump to cool for at least 30 minutes after each five-minute period of continuous operation.

### ENGINE FLUID-OFF HANDLES

A hydraulic fluid shutoff valve is installed in the hydraulic supply line at the firewall in each nacelle. The valves are mechanically actuated by the engine fluid-off handles (figure 1-35) on the fire control panel. (Refer to Engine Fire Extinguisher System, this Section.)

### MAIN HYDRAULIC SYSTEM PRESSURE GAGE

The hydraulic system pressure gage (65, figure 1-8) is located on the copilot's flight instrument panel shelf. The gage is connected to a pressure transmitter powered by 26-volt alternating current. When the pressure bypass handle is in the PRESS. (DWN) position, the hydraulic pressure gage indicates the pressure throughout the hydraulic system. When the bypass handle is in the BYPASS (UP) position, the hydraulic system will be relieved of pressure and the pressure gage will read zero.

### BRAKE HYDRAULIC PRESSURE GAGE

Refer to Brake System, this Section.

### HYDRAULIC ACCUMULATOR AIR PRESSURE GAGE

The hydraulic accumulator air pressure gage in the nosewheel well indicates the air pressure in the accumulator when there is no hydraulic pressure in the system. When the hydraulic pressure is up, the gage will indicate main system pressure with the bypass handle in PRESS. (DWN) and brake system pressure with the bypass handle in BYPASS (UP).

## FLIGHT CONTROL SYSTEM

The primary flight control surfaces are mechanically operated by conventional dual control wheels and pedals. Conventional trim tabs on the ailerons, rudder, and right elevator are mechanically operated by controls on the pilots' pedestal. The aileron trim tabs and right elevator trim tab also act as servo tabs to aid in reducing the control force on the ailerons and elevators. The left elevator tab acts only as a servo tab. Rudder control forces are reduced by the boosting action of an automatically operated flight tab. Initial