



Figure 1-22. DC Control Panel

DC Power Supply System.

Direct current is normally supplied by two engine-driven generators, one in each nacelle. (See figure 1-20.) Two 12-volt batteries connected in series provide a standby source of 24-volt direct-current power. A receptacle adjacent to the battery box on the left wing lower surface trailing edge is provided for connecting external direct-current power. (See figure 1-20 for direct-current operated equipment.) Both the batteries and the generators are normally used in the operation of the system; however, a simplified switching arrangement permits these units to be individually cut into or out of the circuit. Generator output is used to supply direct-current requirements during normal flight conditions and during ground operation when generator output overrides the bus voltage by approxi-

mately 0.5 volt. Battery power is used when generator power and external power is not available and may be used to start the engines in an emergency. A changeover relay, actuated by external power, insures uninterrupted direct-current power when changing from battery to external power or vice versa. An emergency cutoff bar (figure 1-22) allows the pilots to operate five switches simultaneously: the two generator switches and the battery switch are turned OFF; the direct-current power switch and the copilot's flight instrument power selector switch (AC) are turned to EMERG positions. Normally, these switches are operated individually; however, when actuated simultaneously by the emergency cutoff bar, all direct-current power is turned off except battery power to the emergency direct-current bus.

BATTERY SWITCH

A battery switch (figure 1-22), located on the overhead direct-current power control panel, has ON and OFF positions. This switch is used to connect and disconnect the batteries to the main distribution or emergency direct-current buses as selected by the DC power switch.

NOTE

A minimum battery voltage of approximately 18 volts is required to close the battery relay. This relay must be closed before the generators can recharge the battery.

DC POWER SWITCH

The DC power switch (figure 1-22), located on the overhead direct-current power control panel, has NORMAL and EMERG positions. In the NORMAL position, with the battery switch ON, battery power is directed to all buses through the main distribution bus. In the EMERG position, with the battery switch OFF,

battery power is directed only to the emergency bus. Refer to figure 1-20 for a list of equipment operated by emergency direct-current power.

GENERATOR SWITCHES

Two generator switches (figure 1-22) are located on the overhead direct-current power control panel. The switches have ON, OFF, and RESET positions. From the RESET position the switches are spring-loaded to the OFF position.

GENERATOR FIELD SWITCHES

Two magnetic-type circuit breaker switches on the main circuit breaker panel control the generator field circuits. The switches are normally left in the ON position at all times. When a generator has been automatically cut off, the corresponding generator field switch should be checked for the OFF position.

GENERATOR LOADMETERS

The percentage of rated load carried by each generator is shown continuously on two loadmeters (figure 1-22) located on the direct-current control panel.

GENERATOR-INOPERATIVE WARNING LIGHTS

Two red generator inoperative warning lights (figure 1-22) are mounted on the direct-current power control panel. With the generator switches ON, illumination of one of the lights indicates that the corresponding generator output has been disconnected from the bus or that the generator is inoperative. If the generator-inoperative warning light remains on after the generator switch has been momentarily held to RESET and returned to the ON position, a malfunction is indicated and the generator switch must be turned to OFF. The lights operate from the main DC bus.

GENERATOR-OVERHEAT WARNING LIGHTS

Two red generator overheat warning lights are located on the direct-current power control panel (figure 1-22) and operate from the main DC bus. Illumination of one of the lights indicates that the corresponding generator is operating at excessive temperature due to malfunction or bearing failure. The generator may continue to function normally; however, it should be turned off as soon as an overheat condition is indicated.

NOTE

If 400-ampere generator has been installed, the generator overheat warning lights will be removed. Refer to Service Change #37.

EXTERNAL DC POWER RECEPTACLE

An external direct-current power receptacle (figure 1-23) for connecting an external power source to the direct-current buses is located on the lower surface of the left wing trailing edge adjacent to the battery compartment.

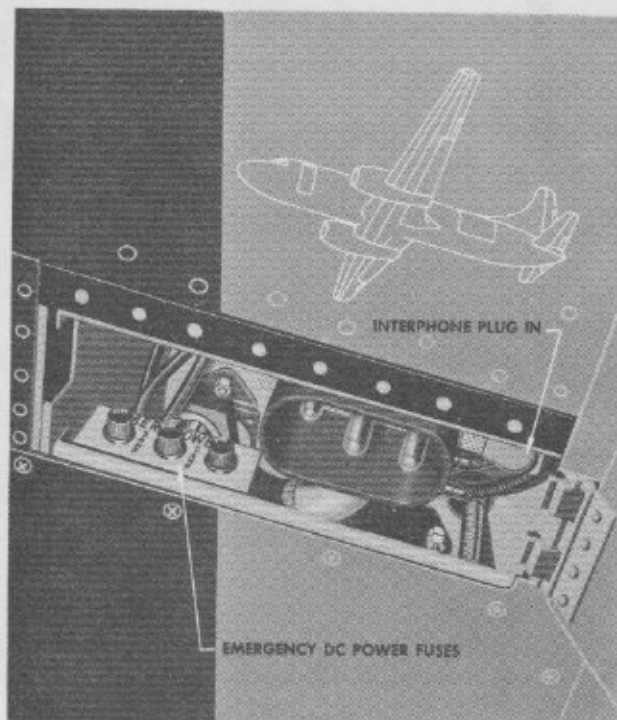


Figure 1-23. External DC Power Receptacle

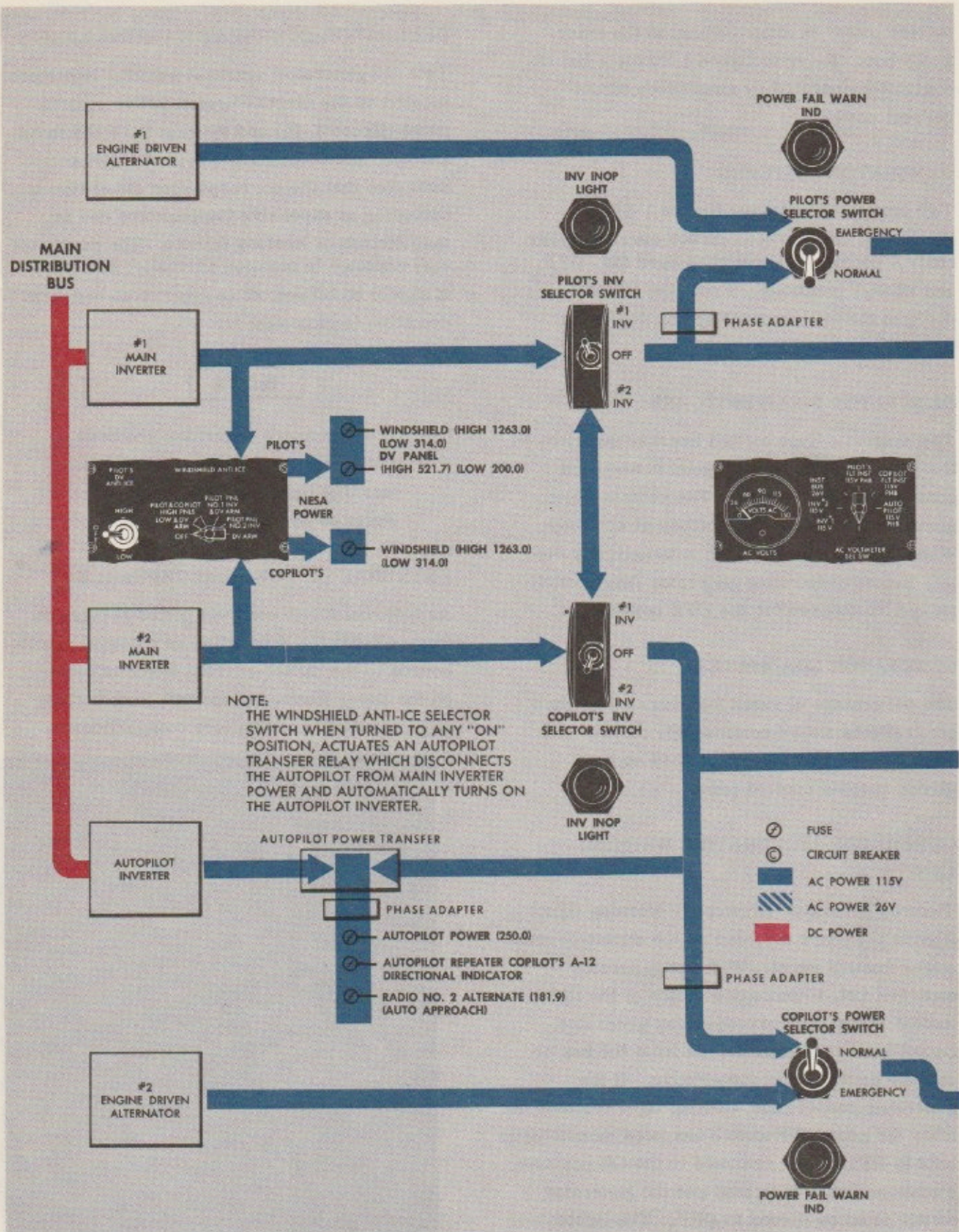


Figure 1-24 (Sheet 1 of 2). AC Power Supply System

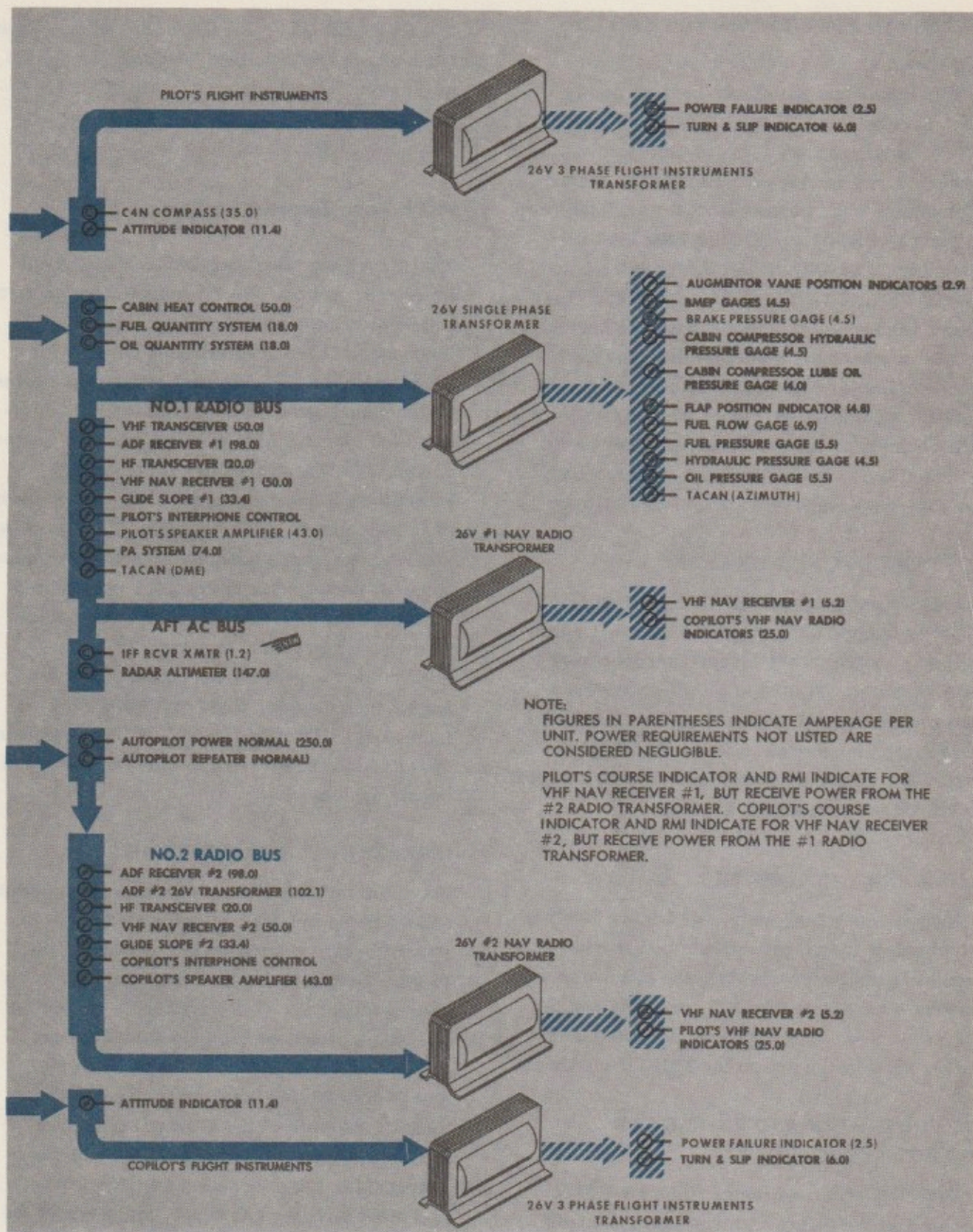


Figure 1-24 (Sheet 2 of 2). AC Power Supply System

EXTERNAL POWER SELECTOR SWITCH

The external power selector switch (figure 1-22), located on the direct-current power control panel, has PLANE BATTERY and EXTERNAL positions. Before an external power source can supply power to the main distribution bus, the selector switch must be in the EXTERNAL position and the battery switch must be ON. If the switch is selected to PLANE BATTERY position while external power is plugged in, the aircraft's batteries supply power to the main distribution bus. If external power is disconnected when the battery switch is ON, the aircraft's batteries will be automatically connected to the bus by action of the changeover relay, regardless of the external power selector switch position.

EXTERNAL-POWER-ON LIGHT

An amber external-power-on light (figure 1-22) is located adjacent to the external power selector switch on the direct-current power control panel. This light glows whenever external power is connected and the external power selector switch is in the EXTERNAL position. Power to operate the light is obtained from the external power source.

EMERGENCY CUTOFF BAR.

A hinged emergency cutoff bar (figure 1-22) is provided on the direct-current power control panel to simultaneously trip the generator and battery switches to the OFF positions and the DC power switch and copilot's flight instrument power selector switch to the EMERG positions.

DC VOLTMETER AND VOLTMETER SELECTOR SWITCH

A direct-current voltmeter (figure 1-22) is located on the direct-current power control panel. The voltage to be measured is selected by the direct-current voltmeter selector switch adjacent to the voltmeter. The switch positions

are OFF, LH GEN, RH GEN, and BUS. These positions produce voltage readings for the LH generator, RH generator or main DC distribution bus. The OFF position renders the voltmeter inoperative.

AC Power Supply System

Two direct-current-operated 2500 VA, main inverters, and one 500 VA autopilot inverter are provided to supply single-phase, constant frequency, 115-volt alternating current for operation of radio equipment, flight and engine instruments, windshield anti-icing, and autopilot equipment. Also provided are two engine-driven, 100 VA alternators which supply emergency flight instrument power in the event of failure of both main inverters. The system incorporates phase adapters to convert single-phase to three-phase current for operation of certain flight instruments. Stepdown transformers are provided to supply 26-volt alternating current for operation of certain engine instruments, flight and navigation indicators. Refer to figure 1-24 for equipment operated by the alternating-current power supply system.

INVERTER SELECTOR SWITCHES

The main inverters are controlled by the pilot's and copilot's inverter selector switches (figure 1-25), located on the overhead switch panel. Both selector switches are side-guarded and have #1 INV, #2 INV, and OFF positions. Each switch performs the dual function of turning on the selected inverter and of distributing inverter power output to specific circuits of the alternating-current system. (Refer to figure 1-24.) With the exception of full windshield anti-ice power, one main inverter can supply the needs of the entire alternating-current power supply system provided both switches are selected to the same (#1 INV or #2 INV) position. There is no