PROPELLER FEATHERING BUTTONS

Four guarded propeller feathering buttons (21, figure 1-12) are on the extreme forward end of the overhead panel. The buttons have PUSH FEATHER--PULL UNFEATHER, and neutral positions. The feathering operation is initiated when the feathering button is pushed. After a fixed time, 18 ±2 seconds, a spring action returns the button to the neutral position. The propeller is unfeathered by pulling the feathering button out intermittently for one second intervals until propeller starts windmilling. The unfeathering operation is accomplished as given in RESTARTING ENGINE IN FLIGHT in Section III. The circuit is supplied with 28 volt DC through four feathering circuit breakers and one timer circuit breaker on the overhead circuit breaker panel (figure 1-34). An additional propeller feathering switch for each engine is on the overhead fire panel. See FIRE SWITCHES this Section.

PROPELLER REVERSE THRUST CONTROL

The propeller reverse thrust is controlled by the throttles. See THROTTLES AND THROTTLE LOCK LEVER in this Section.

PROPELLER OIL REFILL SWITCHES

Four ON--OFF switches (65, figure 1-22) on the engineer's instrument panel are used to energize the propeller oil refilling circuit. Placing the switches ON allows engine oil to flow into the propeller oil tank provided the float switch in the propeller oil tank is approximately at the 2.5 or less quart level as indicated by a warning light. When the propeller oil quantity level reaches approximately 4 quarts, the supply of engine oil is automatically shut off by the float switch even though the switch is left in the ON position. The circuit is supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34), which protects both oil refill and warning light circuits.

RPM LIMIT LIGHTS

Four amber rpm limit lights (35, figure 1-9) on the pilots' instrument panel illuminate to show when the maximum or minimum rpm limit settings are reached. The circuit is supplied with 28 volt DC through an ON--OFF, switch-type circuit breaker on the overhead circuit breaker panel (figure 1-34).

PROPELLER OIL QUANTITY WARNING LIGHTS

Four red warning lights (66, figure 1-22) above the refill switches on the engineer's instrument panel are a part of the propeller oil refill circuit and illuminate whenever the float switch drops to approximately the 2.5 quart level regardless of refill switch position and go off when approximately 1.5 quarts have been added. The circuit is supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34) which protects both warning light and emergency oil refill circuits.

PROPELLER REVERSE WARNING FLAG

A red LOCKED flag (4, figure 1-16) is provided in a housing on the control stand. When the airplane leaves the ground, and all three landing gear oleo switches are actuated, power will be supplied, after an 8 second time delay, to engage a reverse lock on the pilots' throttles, preventing throttle movement into the REVERSE OPEN range. When the lock is engaged, the red flag will pop up and expose the LOCKED marking on the flag, indicating that the propellers cannot be reversed. When any one of the landing gear oleo switches is actuated upon contact with the ground, power is supplied to release the reverse lock and permit throttle movement into the REVERSE OPEN range. When the lock is released, the red flag drops down and an UNLOCKED marking on the housing is exposed, indicating that the propellers can be reversed. The circuit is supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34).

NOTE

If the reverse lock does not release automatically on the ground, it may be released manually by pushing down the red flag.

OIL SYSTEM

CENTRAL OIL SYSTEM

This system (figure 1-24) has a central tank in the lower nose compartment with a capacity of 56 US gallons and an expansion space of 2 US gallons. This supply is used to replenish each engine oil tank as needed. The oil is transferred by an electric pump which has a normal pumping capacity of 6 gallons per minute, and is directed to the desired engine tank by a transfer valve. The circuit is supplied with 28 volt DC through a circuit breaker on the forward power panel.

Oil Tank Selector Switch

A rotary switch (86, figure 1-22) on the engineer's instrument panel controls a tank selector valve. The switch has ENG. 1--ENG. 2--OFF--ENG. 3--ENG. 4--OFF positions. When this switch is positioned in

any one of the four engine positions oil from the central oil tank will be directed to the desired engine tank. When the switch is positioned to OFF the valve is closed. In case of an electrical selector valve failure, the selector valve can be operated manually by removing four screws, pulling the electrical unit slightly forward and turning it to the desired tank as indicated by an index on the selector valve. The valve is on the forward wing spar, accessible from the lower forward compartment. The circuit is supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34).

Oil Transfer Pump Switch

An ON--OFF switch (88, figure 1-22). Spring-loaded from the ON position to the OFF position, and adjacent to the tank selector switch on the engineer's instrument panel, is used to turn on or off the central oil tank transfer pump. The circuit is supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34).

NOTE

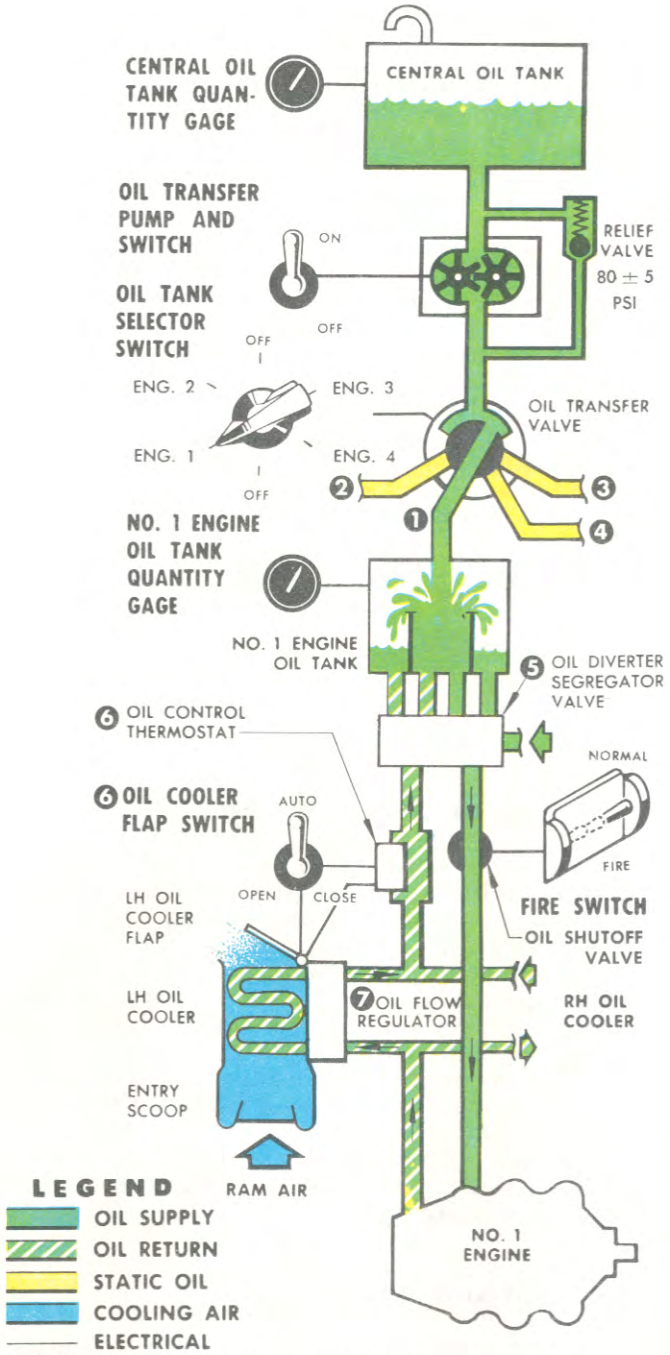
The oil tank selector switch must be in an engine selected position before the transfer pump may be energized.

ENGINE OIL SYSTEM

Each engine has an individual oil system which includes an engine oil tank, two oil coolers, and an oil control thermostat. The engine oil tank has a capacity of 32.5 US gallons and an expansion space of 7 US gallons. Oil cooler flaps switches when in the AUTO position, cause the thermostat to automatically regulate oil temperature by operating the oil cooler flaps to allow the proper amount of cooling air to flow through the oil coolers. An oil dilution system is incorporated into the oil system to aid in cold weather starting.

Oil Diverter Segregator System

The airplane is provided with an oil diverter segregator system which reduces engine warm-up time. This system employs a thermal and pressure operated valve at the base of each engine oil tank. The diverter segregator valve allows oil to flow from and return to the hopper only when the oil temperature is low. Above 125°F (52°C) the valve permits oil to flow from both the hopper and the engine tank. At 155°F (68°C) to 165°F (74°C), oil will flow from the engine oil tank and from the hopper at a ratio of 75 percent and 25 percent respectively. Fuel for dilution is introduced at the thermal valve to obtain a high dilution percentage in the circulatory system. The tank hopper is independent of the engine oil tank except for spill-over at the top of the hopper. A pull chain valve is used to equalize



NO. 1 ENGINE OIL SUPPLY SYSTEM (TYPICAL) FILLING NO. 1 ENGINE OIL TANK

OIL SUPPLY SYSTEM

Figure 1-24

hopper and tank levels during servicing. See OIL SYSTEM OPERATION, Section VII and oil dilution procedures under SHUT-DOWN under COLD WEATHER PROCEDURES in Section IX.

Oil Cooler Flap Switches

The oil cooler flaps for each engine are operated by OPEN--OFF--AUTO--CLOSE switches (32, figure 1-22) on the engineer's instrument panel. The switches are spring-loaded from the OPEN and CLOSE positions to the OFF position. When a switch is in the AUTO position, the oil coolers automatically maintain oil temperature within the normal operating range. If extreme operating conditions exist or failure of the automatic circuit causes abnormal oil temperatures the oil cooler flaps can be operated by the manual OPEN or CLOSE positions. The flaps are held in any desired position by positioning the switch to OFF. Approximately 15 seconds are required to fully open or close the oil cooler flaps when the manual switch positions are used. The circuits are supplied with 28 volt DC through circuit breakers on the overhead circuit breaker panel (figure 1-34).

Oil Dilution Switches

One master OFF--ON (spring-loaded OFF) switch and four engine selector OFF--ON switches (27 and 28, figure 1-22) on the engineer's instrument panel energize the oil dilution solenoids, allowing fuel to mix with engine oil before the oil enters the engine. The four engine selector switches select the engines to be diluted. Dilution is then accomplished by use of the master dilution switch. The circuits are supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34).

Oil Shutoff Valve

A shutoff valve is provided between each engine and engine oil tank. These valves, when closed, will shut off all oil supplied to the engines. The valves are controlled by four fire switches on the overhead panel. See FIRE SWITCHES in this Section.

Oil Quantity Gage

Oil quantity gages (26 and 87, figure 1-22) for each engine oil tank and central oil tank, on the engineer's instrument panel, indicate oil quantity in US gallons. The circuits are supplied with 28 volt DC through circuit breakers on the overhead circuit breaker panel (figure 1-34).

OIL SPECIFICATION AND GRADE

Refer to figure 1-47 for oil specification and grade.

FUEL SYSTEM

The airplane fuel system (figure 1-26) has four internal main fuel tanks, a center wing tank, and two external fuel tanks. The fuel system is arranged so that the engines may be supplied with fuel either directly from the internal main fuel tanks or from the airplane main fuel manifold. The airplane main fuel manifold can be supplied with fuel from any combination of tanks. The center wing tank and the external fuel tanks may be used with either the airplane main fuel manifold or, on Code ▼ airplanes, the A/R system. The external fuel tanks can be shutoff from the airplane main fuel manifold separately or all auxiliary tanks may be isolated together by positioning of two manual shutoff valves located aft of the rear wing spar in the lower aft compartment. Two submerged fuel boost pumps are provided in each tank. The boost pumps are installed in such a manner that the amount of unavailable fuel in extreme flight attitudes is minimized. The boost pumps are controlled by switches on the engineer's instrument panel. Check valves in the boost pump lines prevent transfer of fuel between tanks. See figure 1-25 for individual fuel tank capacity. The external fuel tanks are attached to underslung struts by bomb rack assemblies. A single switch (27, figure 1-12) on the overhead panel controls the tank release circuit.

SINGLE POINT REFUELING

Two single point refueling receptacles, (5 and 6, figure 4-81) located aft and below the left wing rear spar, are used to refuel all fuel tanks except the external fuel tanks. The airplane main fuel tanks are refueled through the forward receptacle, and on tanker airplanes the A/R tank system are refueled through the aft receptacle. See SINGLE POINT REFUELING, Section IV.

AIR REFUELING ▼

When in the tanker configuration, this airplane is equipped to transfer fuel in flight to receiver type airplanes by means of the A/R system. Fuel for this purpose is carried in fifteen fuselage tanks which are connected to form a forward tank system and an aft tank system. (See 27, figure 1-4 and figure 4-71.) Fuel for air refueling may also be carried in the external fuel tanks and the center wing tank. Additional fuel may be pumped from the main fuel tanks to the A/R system. See AIR REFUELING SYSTEM, Section IV and FUEL SYSTEM OPERATION, Section VII.

TANK	NO. OF TANKS	USABLE FUEL			FULLY SERVICED		
		GAL.	JP-4 LB	GAS LB	GAL.	JP-4 LB	GAS LB
NO. 1	1	1770		10,620	1778.7		10,672.2
NO. 2	1	1520		9120	1533.9		9203.4
NO. 3	1	1520		9120	1533.9		9203.4
NO. 4	1	1770		10,620	1778.7		10,672.2
CENTER	1	1210	7865	7260	1218.1	7917.6	7308.6
RH EXT.	1	*691*	*4491*	*4146*	*699.0*	*4543.5*	*4194.0*
LH EXT.	1	*691*	*4491*	*4146*	*699.0*	*4543.5*	*4194.0*
FWD A/R TANK SYSTEM	7	2898	18,837	17,388	2938.0	19,097.0	17,712.0
AFT A/R TANK SYSTEM	8	2912	18,928	17,472	2952.0	19,188.0	17,712.0

ITALIC FIGURES INDICATE CALCULATED DATA

NOTE:

The weights are based on a given specific gravity at standard day temperature.

USABLE FUEL TOTALS	GAL	JP-4 LB	GAS LB
Tanks No. 1, 2, 3, and 4	6580		39,480
Tanks No. 1, 2, 3, 4, and Center	7790		46,740
Tanks No. 1, 2, 3, 4, Center and External	*9172*		*55,032*
Tanks FWD and AFT A/R	5810	37,765	34,860
Tanks FWD and AFT A/R, Center and External	*8402*	*54,613*	*50,412*

FUEL QUANTITY DATA

Figure 1-25

FUEL SPECIFICATION AND GRADE

Refer to figure 1-47 for fuel specification and grade.

FUEL SYSTEM THERMAL RELIEF

The check valves for the main and center wing fuel tanks have bleed holes to provide thermal relief. There are three thermal relief valves having a cracking pressure of 50 ± 5 psi as follows: One relieves the airplane main manifold to No. 2 main fuel tank. One relieves the line between the center wing tank line valve and the manual fuel-shutoff valves to the center wing tank. Another on airplanes 17260 ▶ 22664 relieves the line between the manual fuel-shutoff valves and the transfer valves to the aft A/R tank system; or on airplanes 22665 ▶ this valve relieves the line between the manual fuel-shutoff valves and the external tank manifold shutoff valve to the atmosphere.

FUEL VAPOR RETURN LINES

The fuel vapors from carburetors on engines No. 1 and No. 2 are vented back to main tank No. 2 and the vapors from carburetors on engines No. 3 and No. 4 are vented back to tank No. 3. Normally the rate of return flow is negligible.

FUEL SELECTOR SWITCHES

Four rotary type selector switches (61, figure 1-22) and figure 7-9) on the engineer's instrument panel control the fuel selector valves for the four main fuel tanks. The switches have six positions which permit five combinations as follows:

1. TANK TO ENGINE
2. MANIFOLD TO ENGINE
3. TANK TO MANIFOLD AND ENGINE which also permits fuel flow from TANK AND MANIFOLD TO ENGINE.
4. Two TANK TO MANIFOLD positions
5. OFF

Two shutoff switches for each engine are on the overhead panel. These switches override normal control of fuel selector valves to shut off fuel to the engines. See FIRE SWITCHES in this Section. The selector switches are supplied with 28 volt DC through circuit breakers on the overhead circuit breaker panel (figure 1-34).

FUEL VALVE POSITION WARNING LIGHTS

Four fuel valve position warning lights (67, figure 1-22), adjacent to the fuel selector switches, illuminate if the valve is not synchronized with the switches. This can be caused by system lag, selector valve failure, or fire switch actuation. The lights are of the push-to-test type. The selector switch and warning light circuits are supplied with 28 volt DC through circuit breakers on the overhead circuit breaker panel (figure 1-34).

FUEL SYSTEM MANUAL FUEL-SHUTOFF VALVES

Two manual fuel-shutoff valves, No. 1 and No. 2, (figure 1-26) are provided in the fuel system to direct the flow of fuel from the auxiliary tanks to either the airplane main fuel manifold or the A/R system, for Code V airplanes. These valves are located just aft of the rear spar in the lower aft compartment. With the No. 1 valve open and the No. 2 valve closed, the external fuel tanks are shut off from the airplane main fuel manifold. When the center wing tank line valve is opened, fuel will be directed from the center wing tank to the main fuel manifold. With both manual fuel-shutoff valves open, and the A/R transfer valve switches at CLOSED, fuel from the external fuel tanks is directed to the airplane main fuel manifold. Fuel from the center wing tank is also directed to the main fuel manifold when the center wing tank line valve is open. With the No. 1 manual fuel-shutoff valve closed, both external fuel tanks and the center wing tank are shut off from the airplane main fuel manifold. On airplanes with 1C10 KGT307 incorporated, an additional manual fuel-shutoff valve, No. 3 extends the cruising range of the airplane. For location and operation of the No. 3 manual fuel-shutoff valve, refer to Section IV and Section VII.

CENTER WING TANK LINE VALVE SWITCH

An OPEN--CLOSE switch on the engineer's instrument panel (62, figure 1-22 and figure 7-9) controls the center wing tank valve. With the switch OPEN, the No. 1 manual fuel-shutoff valve open, and the No. 2 manual fuel-shutoff valve closed, fuel will flow from the tank into the manifold system. On Code V airplanes if the valve positions are reversed, fuel will flow into the A/R tanks provided the transfer valves are open. With the switch in the CLOSE position fuel cannot be drawn from the center wing tank. The circuit is supplied with 28 volt DC through the center wing tank boost pump circuit breaker on the overhead circuit breaker panel (figure 1-34).

WARNING

Incorrect positioning of the manual fuel-shutoff valves and on Code V airplanes, the A/R transfer valves, may allow fuel to be transferred to the A/R system. See FUEL SYSTEM OPERATION in Section VII.

BOOST PUMP SWITCHES

Each fuel tank has two fuel boost pumps. These pumps are controlled individually by EMERGENCY--OFF--NORMAL switches (60, figure 1-22 and figure 7-9) on the engineer's instrument panel. When the boost pump switches are on NORMAL with a no-flow condition (engine inoperative), fuel pressure will be 12 to 20 psi. When the boost pump switches are on EMERGENCY with a no-flow condition, fuel pressure will be 24 to 40 psi. When the boost pump switches are on NORMAL with a flow condition (engine operating), fuel pressure will be 24 to 26 psi. When the boost pump switches are on EMERGENCY with a flow condition, fuel pressure will be 24 to 30 psi. When the boost pump switches are OFF, the boost pumps are inoperative. The fuel pressure regulator on the engine driven fuel pump regulates fuel pressure between 24 and 26 psi. However, fuel pressure gage calibration should be applied when checking these tolerances. With the engine operating, and with fuel pressure within limits, it is possible to have a drop in pressure when the boost pump switches are placed in NORMAL. The sudden surge in fuel pressure can cause the bypass valve to seek a new position. This new position can increase the amount of fuel being bypassed and this in turn can result in a drop in fuel pressure. The boost pump switches are supplied with 28 volt DC through circuit breakers on the overhead circuit breaker panel, (figure 1-34).

EXTERNAL FUEL TANK RELEASE SWITCH

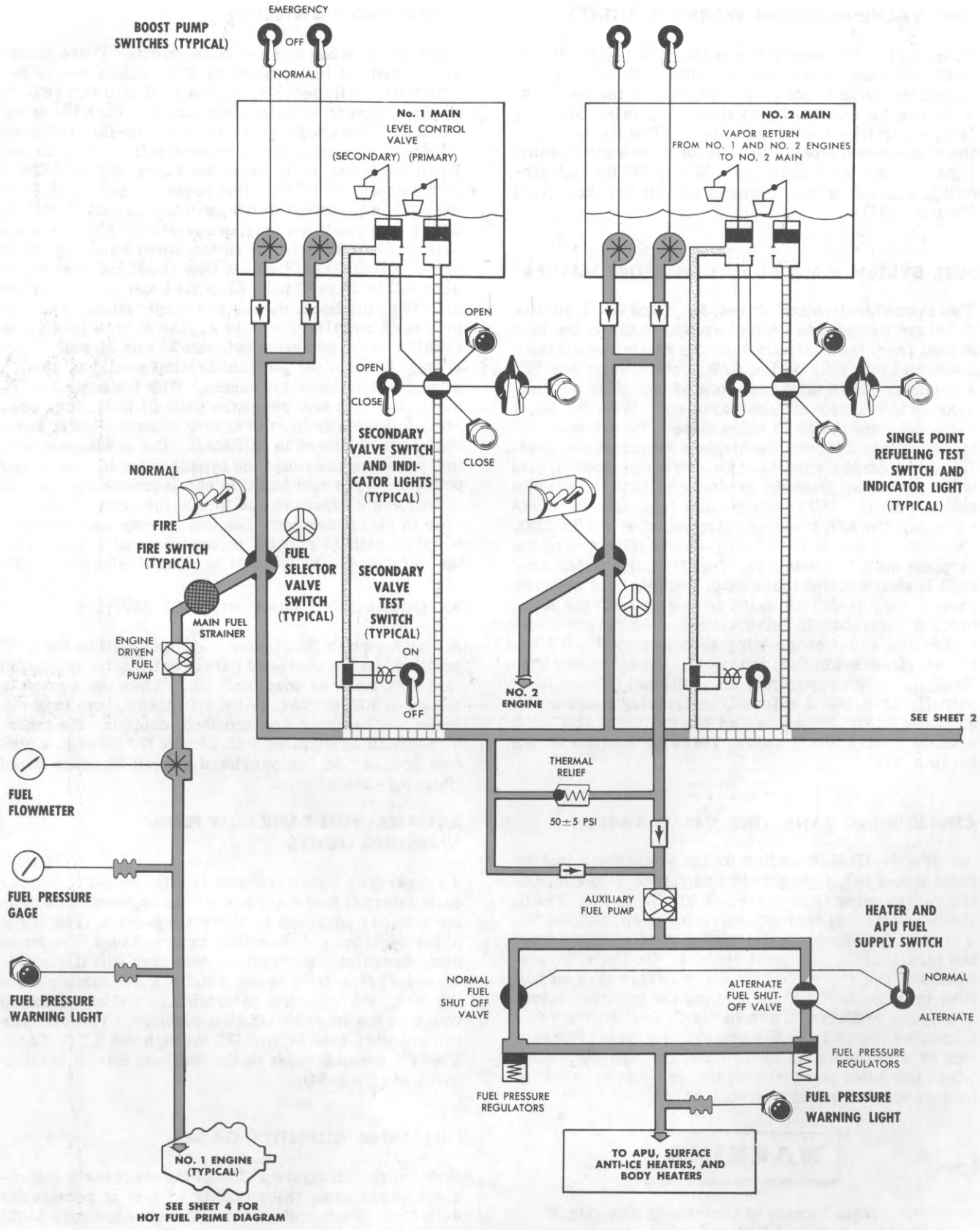
A single switch (27, figure 1-12) guarded to the OFF position, on the overhead panel controls both external fuel tank release mechanisms. When the switch is moved to EXTERNAL TANK RELEASE, both tank release mechanisms are actuated, dropping the tanks. The circuit is supplied with 28 volt DC through a circuit breaker on the overhead circuit breaker panel (figure 1-34).

EXTERNAL FUEL TANK LOW FLOW WARNING LIGHTS

Two warning lights (69 and 71, figure 1-22) one for each external fuel tank, are on the engineer's instrument panel adjacent to their respective tank boost pump switches. With either external fuel tank boost pump operating, the light for that tank will illuminate when fuel flow falls below 6 gallons per minute from the tank. Each light is controlled by a flow indicating check valve in each tank supply line. The circuits are supplied with 28 volt DC through the EXT. TANK EMPTY circuit breaker on the overhead circuit breaker panel (figure 1-34).

FUEL TANK QUANTITY GAGES

Five gages (72, figure 1-22) on the engineer's instrument panel show the quantity of fuel in pounds for each tank. Push-button test switches (70, figure 1-22) adjacent to the gage are used to show circuit continuity of the fuel quantity indicating circuits. The circuits are supplied with 115 volt AC through circuit protection on the AC power panel (figure 1-34).



AIRPLANE FUEL DISTRIBUTION SYSTEM

Figure 1-26 (Sheet 1 of 4)

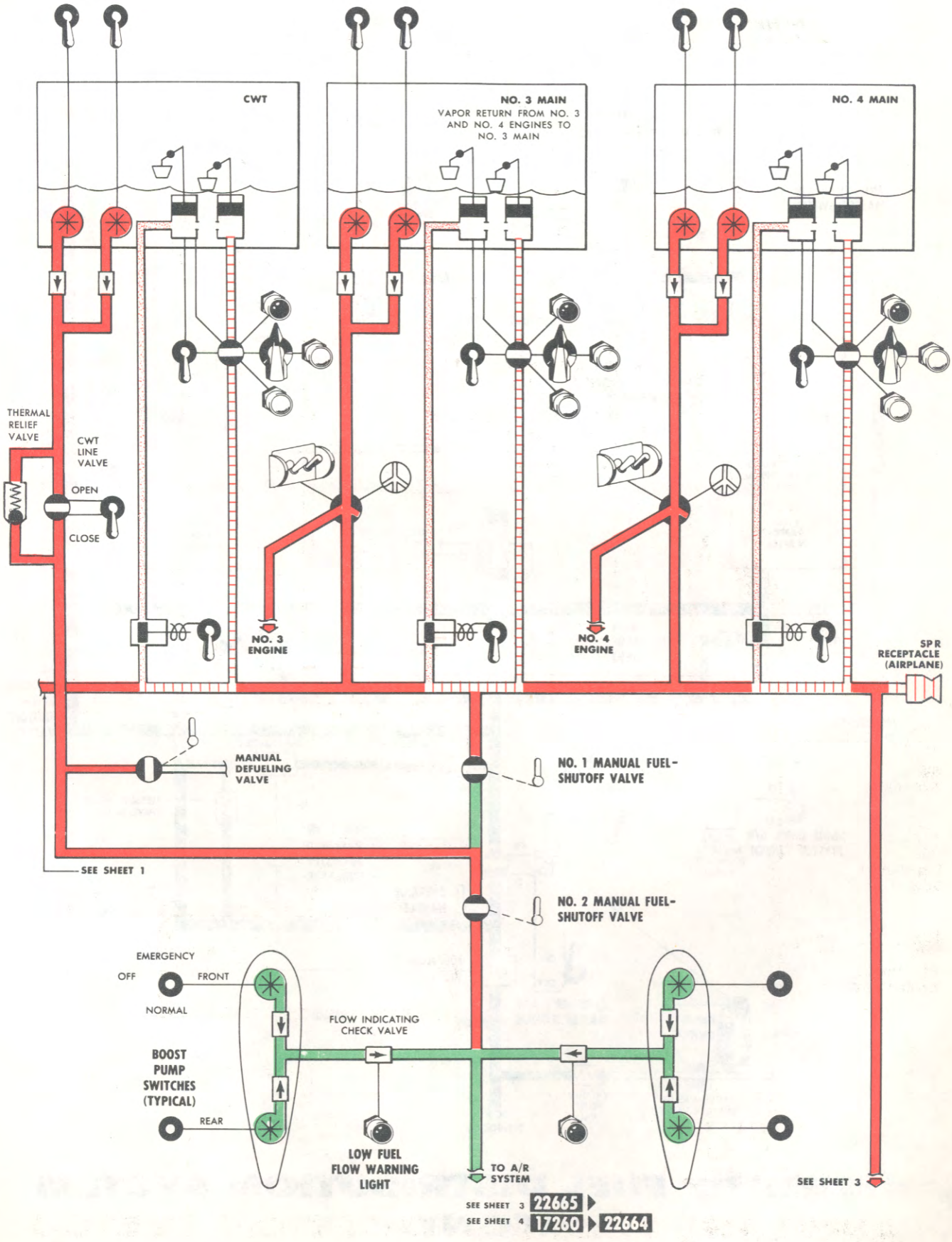
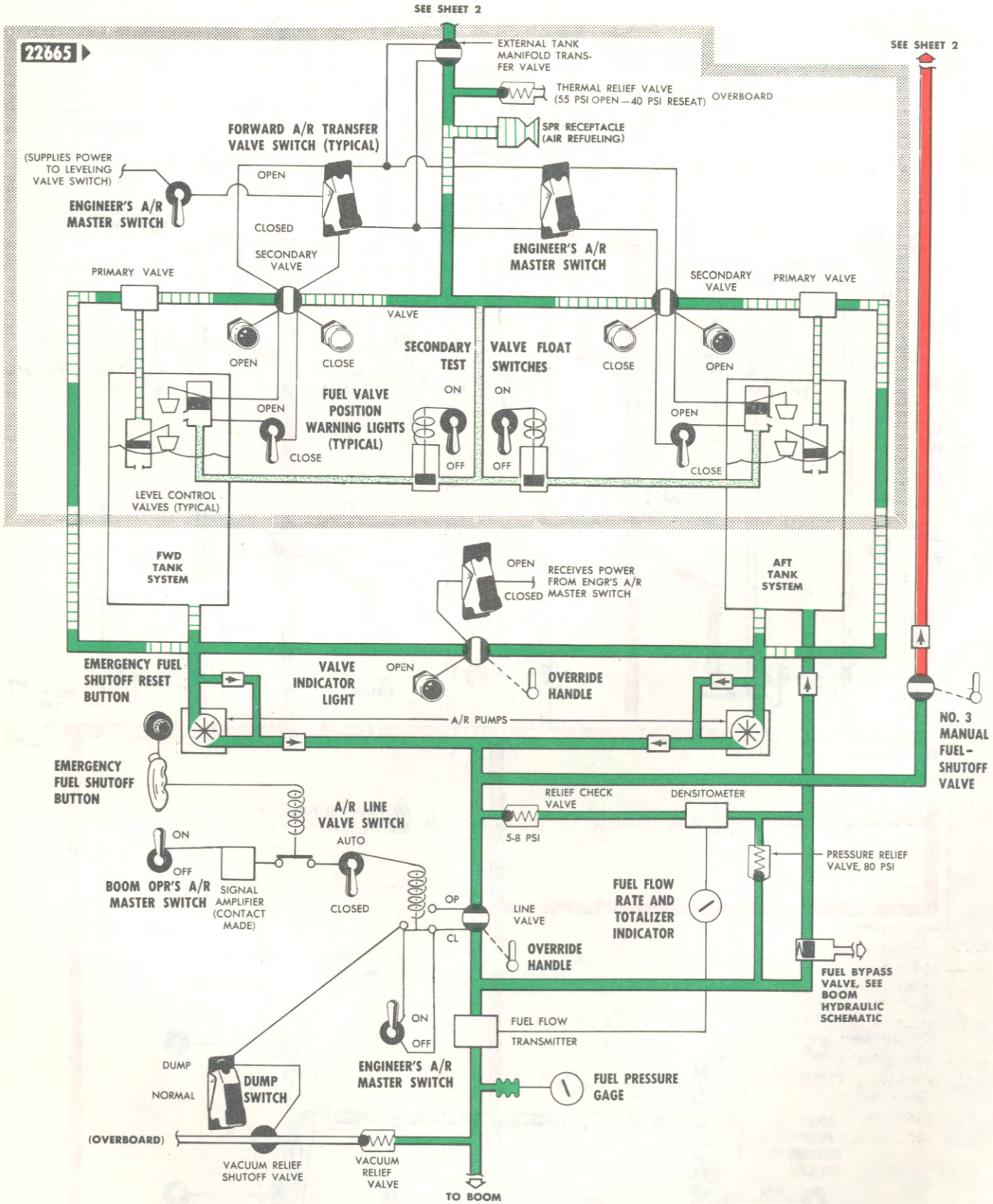
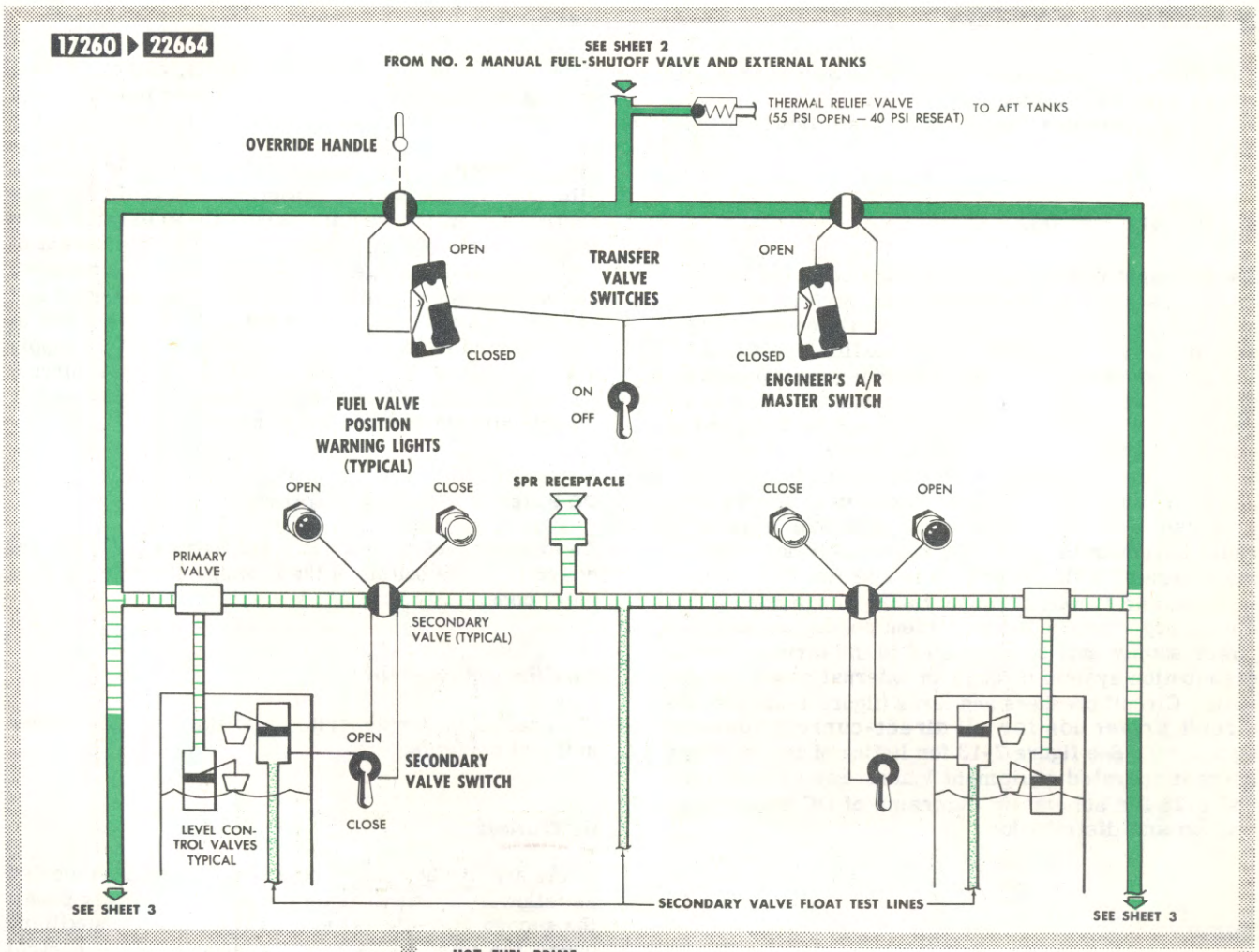


Figure 1-26 (Sheet 2 of 4)



AIRPLANE FUEL DISTRIBUTION SYSTEM (CONT)

Figure 1-26 (Sheet 3 of 4)



NOTE: For complete SPG Receptacle schematic see Single Point Refueling and A/R Fuel System Section IV

- AIRPLANE FUEL
- A/R FUEL
- SINGLE POINT REFUELING (AIRPLANE)
- SECONDARY VALVE FLOAT TEST LINE (AIRPLANE)
- SINGLE POINT REFUELING (A/R)
- SECONDARY VALVE FLOAT TEST LINE (A/R)
- ELECTRICAL
- MECHANICAL

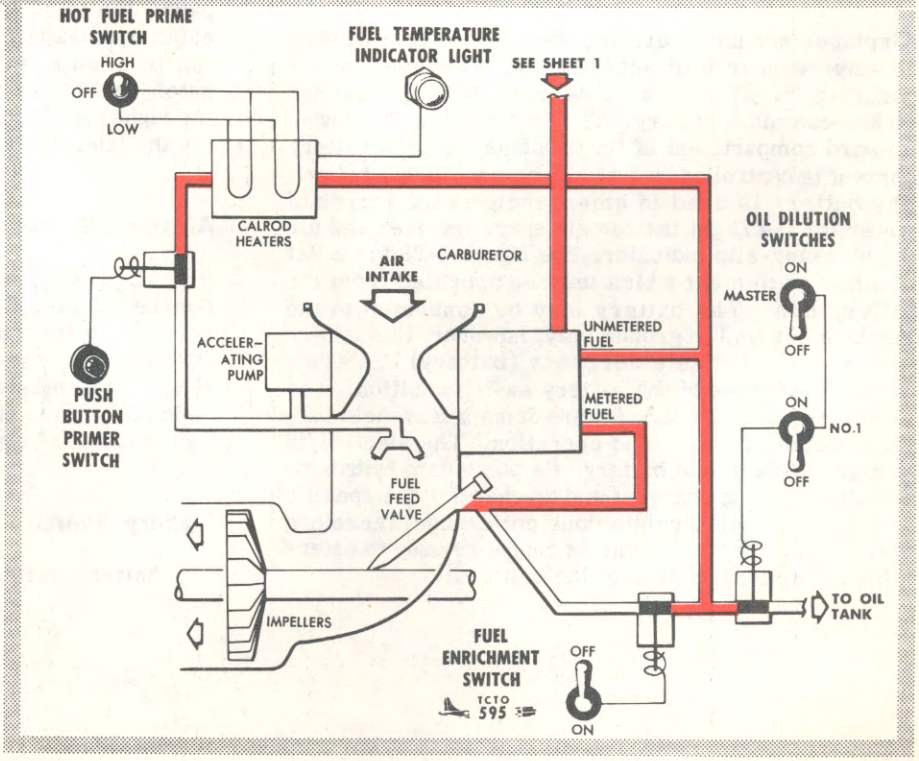


Figure 1-26 (Sheet 4 of 4)

ELECTRICAL SYSTEM

The electrical systems are the DC power system, AC power system, and variable frequency AC system. These systems are described in the following paragraphs.

DC POWER SYSTEM

Twenty-eight volt DC power is supplied to the DC distribution system by six engine-driven generators and by an auxiliary power unit. (See Section IV for description and operating instructions for the auxiliary power unit.) Parallel operation on the DC system is accomplished by an equalizing circuit. This circuit is common to all generators operating in parallel and is designed to cause all generators to take an equivalent share of the load. If an unbalance occurs such that one generator has high voltage with respect to the other generators, a current flow will result in the equalizer circuit to cause the generator with high voltage to be lowered and the generator with low voltage to be raised. A battery in the lower forward compartment is provided as an emergency source of direct current power. An external power supply may be connected to the direct-current distribution system through an external power receptacle. Circuit breakers and fuses (figure 1-33) provide circuit protection for all direct-current operated equipment. See figure 7-13 for listing of major direct current operated equipment loads. See figures 1-27 and 1-28 for schematic diagrams of DC power generation and distribution.

Battery

Airplanes not incorporating ▲ 1C19 551 ▶ have a 24-volt 34 ampere-hour lead-acid battery. Airplanes incorporating ▲ 1C19 551 ▶ have a 24-volt, 36 ampere-hour nickel-cadmium battery. The battery is in the lower forward compartment of the airplane. Use of battery current is controlled by a switch on the overhead panel. The battery is used in emergencies as a source of power for the flight instrument spare inverter and for the turn-and-slip indicator. See figure 1-28 for a list of other equipment which may be operated from the battery bus. The battery may be connected to the airplane bus on the ground only, however, the battery is connected to the emergency (battery) bus at all times regardless of the battery switch position. The nickel-cadmium battery differs from a lead-acid battery in both principle and operation. The electrolyte in a nickel-cadmium battery is a potassium hydroxide solution. During charging and discharging the specific gravity of the electrolyte does not change, therefore specific gravity measurements cannot be used to determine the state of charge of the battery.

Generators

Each of the six 28 volt, 300 ampere, engine-driven generators is connected to the main power panel through a current limiter. The current limiter protects the bus against a generator or reverse current relay failure. The voltage is regulated automatically by carbon-pile type regulators. Each generator has an overvoltage control unit which will disconnect the generator from the direct-current distribution system in the event of high generator voltage. Two generators are mounted on the accessory section of each outboard engine and one generator is mounted on the accessory section of each inboard engine. The generators normally supply all of the power required for operation of direct-current operated equipment in the airplane, and also supply direct-current power to the inverters.

DC External Power Receptacle

An external power receptacle (17, figure 1-47) for DC power is on the bottom of the fuselage near the forward entry door.

Auxiliary Power Unit

See Section IV for description of the auxiliary power unit and controls.

DC Outlets

There are five 28 volt DC outlets in the airplane located as follows: The first is on the pilot's auxiliary panel; the second is on the aft side of the copilot's auxiliary panel; the third is on the forward side of the control cabin bulkhead, adjacent to the navigator's table; the fourth is adjacent to and aft of the left rear escape hatch; and the fifth is directly across the fuselage on the right side from the fourth. These outlets are used for the interairplane signal lamps.

Airplane Master Switch

The airplane master switch (41, figure 1-12) on the overhead panel completes the control circuit for the battery and generators. This ON--OFF switch must be ON to supply power to the DC power distribution system. If the master switch is off, the circuits to the field coils of the generators are broken and there is no output from the generators.

Battery Switch

The battery switch (2, figure 1-12) is adjacent to the

master switch on the overhead panel and has three positions; ON BUS--OFF--BAT CHG. The battery is isolated from the DC power distribution system when the switch is in the OFF position. To preclude the possibility of damage to the battery, the battery switch should be in the OFF position when the airplane is on the ground with the external power connected. When the airplane is on the ground and the battery switch is positioned to ON BUS, the battery is connected to the DC power distribution system. A landing gear actuated oleo switch, opens when the airplane leaves the ground and de-energizes the reverse current relay making it impossible to connect the battery to the DC power distribution system during flight while the battery switch is ON BUS or OFF. When the battery switch is placed in the BAT CHG. position and the master switch is on, the reverse current relay will close to permit charging of the battery when battery voltage is sufficiently less than bus voltage; however the relay is energized by battery power and will not close if the battery voltage is below approximately 18 volts. If the current flow is reversed (battery to bus), the reverse current relay will open to prevent discharging the battery. The battery switch and control circuit is protected by a circuit breaker on the forward power panel, emergency bus (figure 1-34).

Generator Switches

Six individual generator switches (52, figure 1-22) control the engine driven generators. These switches have ON--OFF--FIELD RESET positions and are guarded to the ON position. When a switch is in the ON position the generator delivers power to the DC power distribution system if generator voltage is sufficiently high, but not so high to trip the over-voltage relay, and the master switch is ON. In the OFF position, the generator is disconnected from the distribution system. The FIELD RESET position is used to reset the generator field relay and restore generator operation after the field relay has been tripped by generator overvoltage. The generator control switches are spring-loaded to the OFF position from the FIELD RESET position. The generator field relay control circuits are protected by two circuit breakers on the overhead circuit breaker panel (figure 1-34). Each generator control circuit and each generator field is protected by a circuit breaker on the main circuit breaker panel (figure 1-34).

Generator Voltage Rheostats

Generator voltage rheostats, (53, figure 1-22) one for each generator, are behind a hinged cover on the engineer's instrument panel. The rheostats are to be used in conjunction with the loadmeters and voltmeters for adjusting generator output voltage to equalize generator load distribution.

DC Voltmeter Selector Switch and Voltmeter

A rotary-type switch (54, figure 1-22) and a single direct-current voltmeter (56, figure 1-22) on the engineer's instrument panel provide a means of reading individual generator or direct current bus voltage, as selected by the DC voltmeter selector switch. The switch positions are marked OFF--GEN 1 OUTBD--GEN 1 INBD--GEN 2--BUS--GEN 3--GEN 4 INBD--GEN 4 OUTBD--APU--BATTERY. In the OFF position the switch disconnects the voltmeter from any power source. The output voltage of any of the generators or the battery is determined by rotating the switch to the appropriate position and reading the voltmeter. When the switch is in the BUS position, the voltmeter is connected to the main power panel distribution bus. Each of the circuits from the power sources to the voltmeter selector switch, except the circuit from the auxiliary power unit generator, is protected by a circuit breaker on the main circuit breaker panel (figure 1-34).

Generator Warning Lights

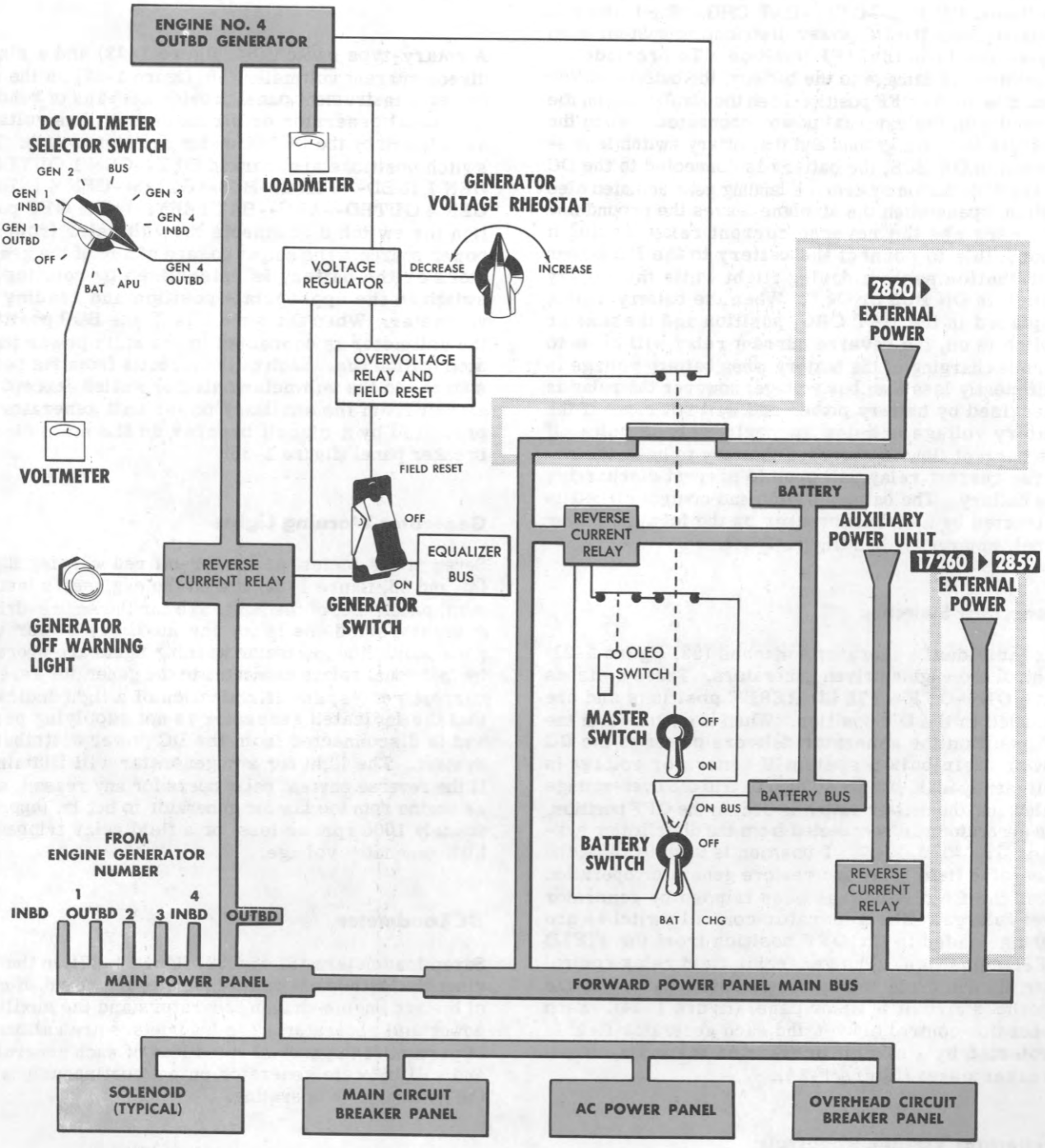
Seven press-to-test generator-off red warning lights (49 and 68, figure 1-22) are on the engineer's instrument panel. Six of the lights are for the engine-driven generators and one is for the auxiliary power unit generator. The generator warning lights are operated by individual relays connected to the generator reverse current relays, and illumination of a light indicates that the indicated generator is not supplying power and is disconnected from the DC power distribution system. The light for any generator will illuminate if the reverse current relay opens for any reason, such as engine rpm too low for generator to cut in, (approximately 1000 rpm or less) or a field relay tripped by high generator voltage.

DC Loadmeter

Seven loadmeters (51 and 57, figure 1-22) on the engineer's instrument panel indicate the output of each of the six engine-driven generators and the auxiliary power unit generator. The loadmeters are calibrated in percent of the normal rated load of each generator, and will indicate generator output continuously when the generator is operating.

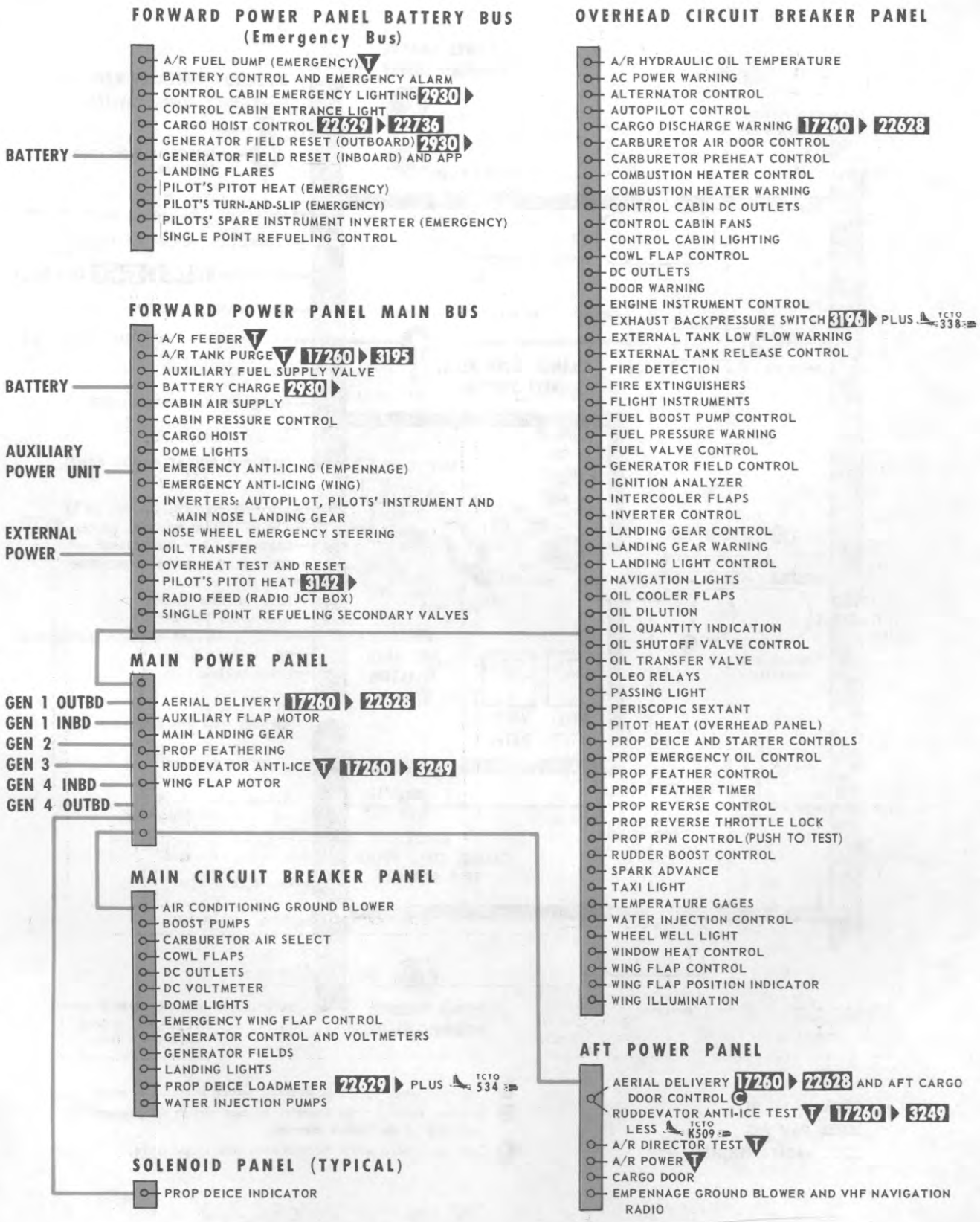
AC POWER SYSTEM

The AC power system consists of three separate groups of inverters; the main inverter system, autopilot inverter system, and pilots' instrument inverter system.



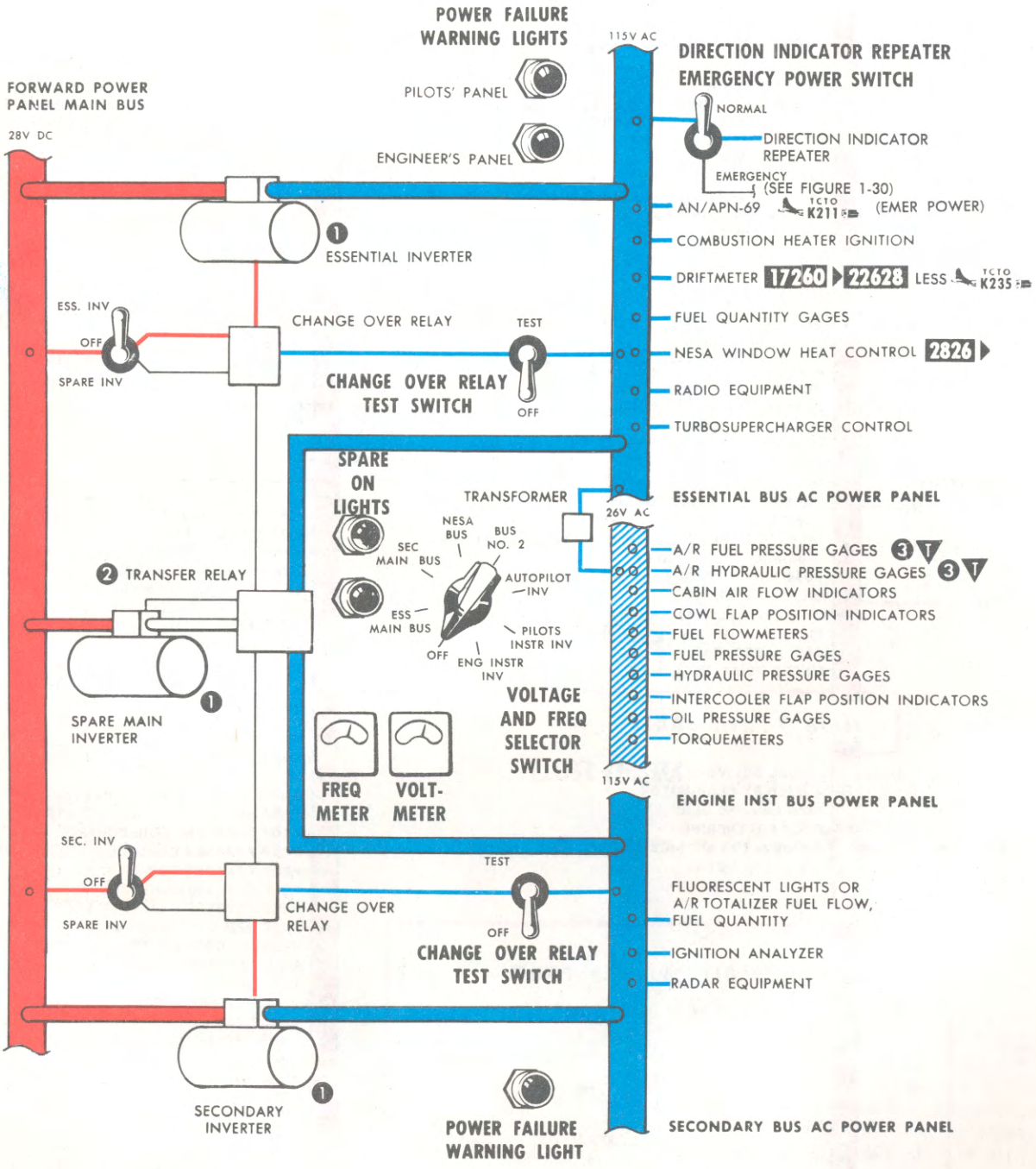
DC POWER GENERATION

Figure 1-27



DC POWER DISTRIBUTION

Figure 1-28



MAIN INVERTER POWER GENERATION AND DISTRIBUTION

Figure 1-29

Main Inverters

2500-VOLT-AMPERE INVERTERS

Three 2500-volt-ampere inverters provide 115-volt, 400-cycle, single phase, alternating current to the essential and secondary AC busses. The inverters are the essential, secondary and spare main. The essential inverter supplies power to the essential bus. The secondary inverter supplies power to the secondary bus.

SPARE MAIN INVERTER

The spare main inverter automatically supplies power to either the essential or secondary bus in the event of essential or secondary main inverter failure. If the essential inverter should fail while the spare main inverter is supplying the secondary bus, the spare main inverter will automatically be changed over to the essential bus.

POWER SUPPLY

Each of the three main inverters receives DC power from the forward power panel (figure 1-34) through a current limiter. See figure 1-29 for a schematic diagram of the main inverter system.

MAIN INVERTER SWITCHES

Two switches (46 and 50, figure 1-22) on the engineer's instrument panel control the three inverters in the main inverter system. One switch with ESS INV--OFF--SPARE INV positions energizes and connects the essential main inverter to the essential bus when in the ESS INV position. The second switch marked SEC INV--OFF--SPARE INV energizes and connects the secondary main inverter to the secondary bus when in the SEC INV position. If the essential main inverter becomes inoperative, the spare main inverter is automatically energized and connected to the essential bus. The SPARE INV position on each switch provides a means of manually disconnecting either the essential or secondary main inverters from their respective busses, and connecting the spare main inverter to the selected bus. When the switches are in the OFF position no power is connected to the busses. If the spare main inverter is supplying the secondary bus, and the essential main inverter switch is moved from either the ESS INV or OFF position to the SPARE INV position, the spare main inverter will be connected to the essential bus; also, if the essential main inverter becomes inoperative while the spare main inverter is supplying the secondary bus, the spare main inverter automatically will be transferred to the essential bus. Each of the two main inverter control circuits is protected by a circuit breaker on the overhead circuit breaker panel (figure 1-34).

MAIN INVERTER WARNING LIGHTS

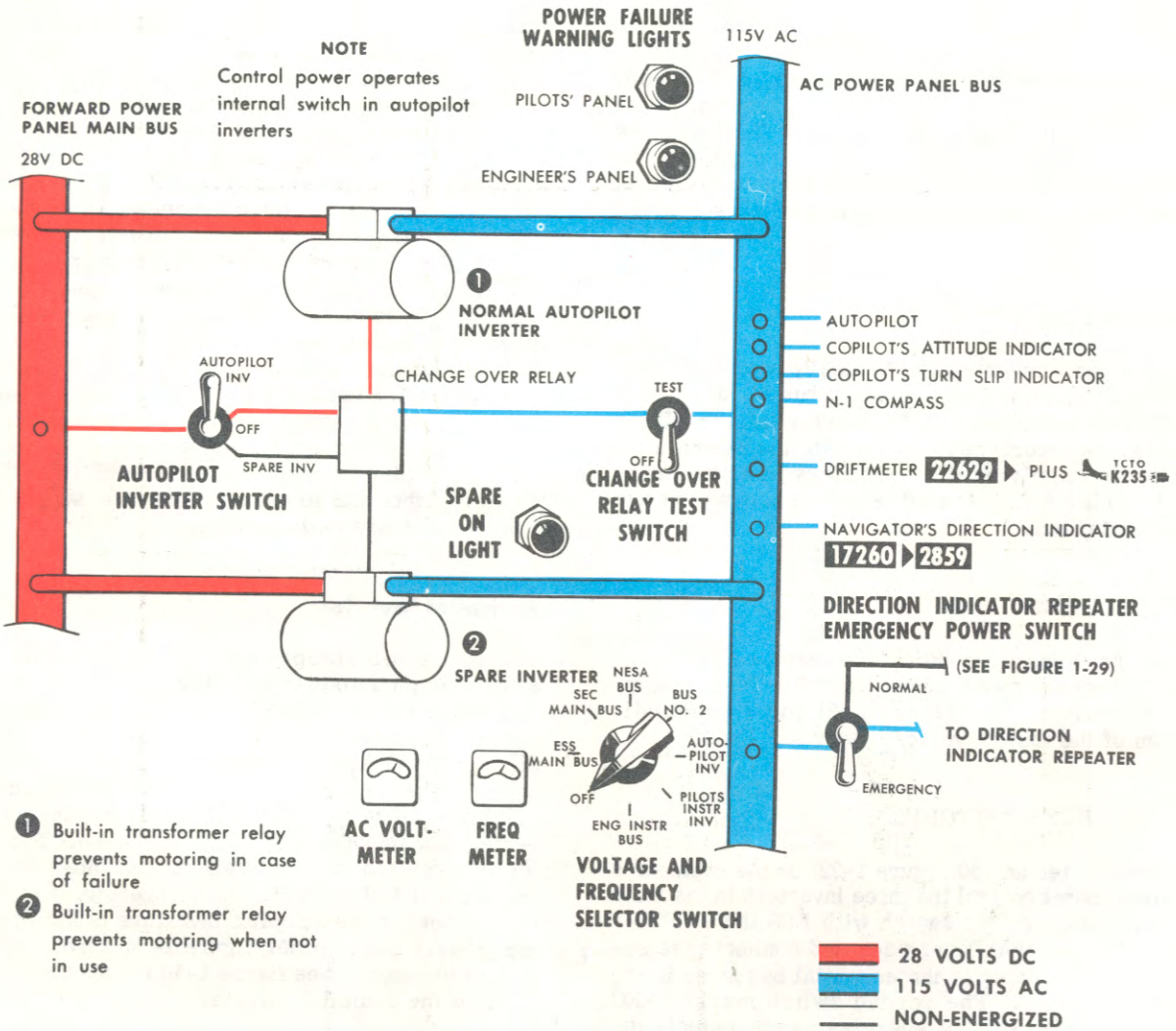
There are five press-to-test main inverter warning lights. Two red lights and two amber lights (44, figure 1-22) are on the engineer's instrument panel and one red light (7, figure 1-9) is on the pilots' instrument panel. In event of failure of the essential main inverter, a red light on the engineer's instrument panel and a red light on the pilots' instrument panel will illuminate. When the spare main inverter automatically assumes the load of the essential main inverter, or when the essential main inverter switch is positioned to SPARE INV, an amber light on the engineer's instrument panel will illuminate and the red warning lights will go out. In event of failure of the secondary main inverter, the second red light will illuminate, and the second amber light will illuminate on the engineer's instrument panel if the spare main inverter automatically assumes the load of the secondary inverter, or if the secondary inverter switch is positioned to SPARE INV. The red warning lights will go out when power is supplied to the bus by the spare main inverter.

Autopilot Inverters

There are two autopilot inverters; a normal and a spare. Each autopilot inverter has a capacity of 750 volt-amperes, and produces 115 volt, 400 cycle, 3 phase alternating current for operation of the autopilot and navigator's directional indicator. Either of the two inverters may be selected for operation. In the event of failure of the normal inverter, the spare inverter is automatically put into operation. The normal inverter will not automatically be put into operation in the event of failure of the spare inverter. Direct-current power for the autopilot inverters is supplied from the forward power panel (figure 1-34) through thermo-circuit breakers. See figure 1-30 for a schematic diagram of the autopilot inverter system.

AUTOPILOT INVERTER SWITCH

A switch (48, figure 1-22) on the engineer's instrument panel, with AUTOPILOT INV--OFF--SPARE INV positions, controls the normal and spare autopilot inverters. When the switch is in the AUTOPILOT INV position, the normal autopilot inverter is energized and supplies power to the autopilot, copilot's attitude indicator, copilot's turn and slip indicator, N-1 compass, the drift-meter on airplanes 22629 ▶ plus ◀ AFTO K235 ▶ and the navigator's directional indicator on airplanes 17260 ▶ 2859 ◀ . If the normal autopilot inverter becomes inoperative, the spare inverter automatically becomes energized and assumes the load. When the switch is in the SPARE INV position, the spare autopilot inverter supplies power to the autopilot, but if the spare inverter fails, the normal inverter will not be energized automatically. When the switch is in the OFF position no power is supplied to the instruments mentioned above. Each of the two autopilot inverter control cir-



AUTOPILOT INVERTER AC POWER GENERATION AND DISTRIBUTION

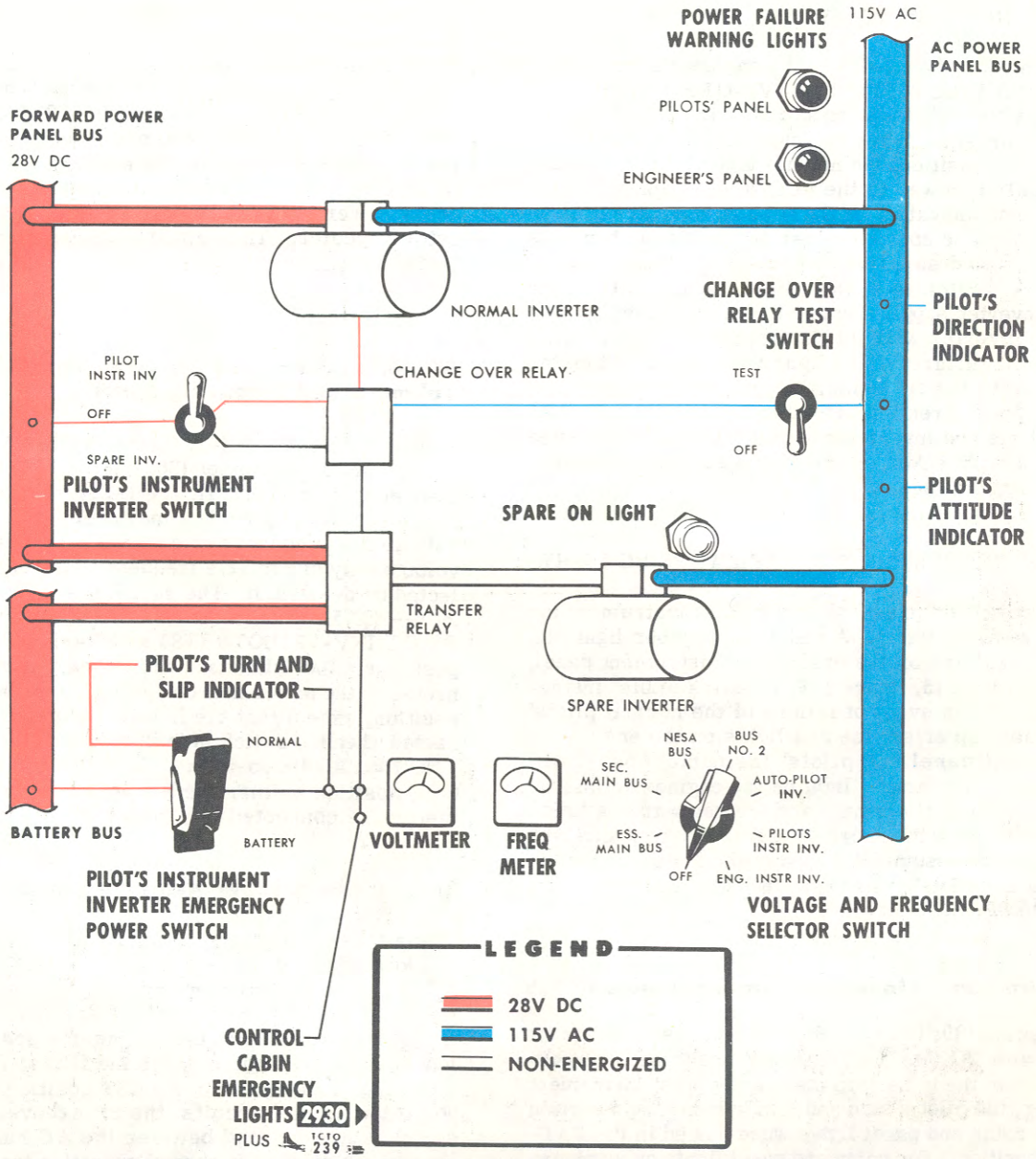
Figure 1-30

cuits is protected by a circuit breaker on the overhead circuit breaker panel (figure 1-34).

AUTOPILOT INVERTER WARNING LIGHTS

There are three press-to-test autopilot inverter warning lights. An amber and a red light (44, figure 1-22) are on the engineer's instrument panel, and a red light (11, figure 1-9) is on the pilots' instrument panel.

The red warning lights indicate no power is supplied to the autopilot bus. In event of failure of the normal autopilot inverter, the red light on the engineer's instrument panel and the red light on the pilots' instrument panel will illuminate. The amber light on the engineer's instrument panel will illuminate and the red lights will go out when the spare autopilot inverter automatically assumes the load of the normal inverter or if the autopilot inverter switch is positioned to SPARE INV.



PILOTS' INSTRUMENT INVERTER AC POWER GENERATION AND DISTRIBUTION

Figure 1-31

Pilots' Instrument Inverters

There are two pilots' instrument inverters; a normal and a spare. Each of the inverters has a capacity of 100 volt-amperes, and supplies 115-volt, 400 cycle, 3-phase alternating current for the operation of the pilot's directional indicator and attitude indicator. Either of the two inverters may be selected for operation, and in the event of failure of the normal instrument inverter, the spare inverter is automatically put into operation. However, the normal instrument inverter will not be put into operation automatically in event of failure of the spare inverter. Each of the two inverters receives DC power from the forward power panel through circuit breakers. In emergencies, the spare inverter may receive power from the battery through a circuit breaker on the forward power panel (figure 1-34). See figure 1-31 for a schematic diagram of the pilots' instrument inverter system.

PILOTS' INSTRUMENT INVERTER SWITCH

A switch (47, figure 1-22) on the engineer's instrument panel with PILOTS' INSTR INV--OFF--SPARE INV positions controls the normal and spare pilots' instrument inverters. When the switch is in the PILOTS' INSTR INV position, the normal inverter is energized and supplies power to the pilot's direction indicator and attitude indicator. If the normal inverter becomes inoperative, the spare inverter automatically becomes energized and supplies power for the instruments. When the switch is in the SPARE INV position, the spare inverter supplies power to the instruments. The normal inverter will not be energized automatically in case of failure of the spare inverter. When the switch is in the OFF position, no power is supplied to the pilot's direction indicator or attitude indicator. Each of the two inverter control circuits is protected by a circuit breaker on the overhead circuit breaker panel (figure 1-34).

PILOTS' INSTRUMENT INVERTER WARNING LIGHTS

There are three press-to-test pilots' instrument inverter warning lights. A red and an amber light (44, figure 1-22) are on the engineer's instrument panel, and a red light (5, figure 1-9) is on the pilots' instrument panel. In event of failure of the normal pilots' instrument inverter, the red lights on the engineer's instrument panel and pilots' instrument panel will illuminate. The amber light on the engineer's instrument panel will illuminate and the red warning lights will go out when the spare pilots' instrument inverter automatically assumes the load of the normal inverter, or when the pilots' instrument inverter switch is positioned to SPARE INV.

Pilots' Instrument Inverter Emergency Power Switch

This switch (39, figure 1-9) on the pilots' instrument panel, with NORMAL--BATTERY positions, connects power from the battery to the spare pilots' instrument inverter, the pilot's turn and slip indicator and certain control cabin and panel lights when placed in the BATTERY position. For cabin and panel lights on airplanes 2930 ▶ that can be operated on battery power through the pilot's instrument inverter emergency power switch, see figure 4-40. When the switch is in the NORMAL position, power is supplied to the pilots' instrument inverter by the DC power distributing system. The pilots' instrument emergency power control circuit is protected by a circuit breaker on the forward power panel battery emergency bus (figure 1-34).

Direction Indicator Repeater Emergency Power Switch and Warning Light

This switch (26, figure 1-9) with NORMAL--EMERGENCY positions, is located on the pilots' instrument panel. When the switch is in the NORMAL position, power is supplied to the direction indicator repeater from the essential bus on the AC power panel. When the switch is placed in the EMERGENCY position, power is supplied only to the copilot's compass repeater indicator from the normal or spare autopilot inverter, whichever is operating. The direction indicator (gyro compass) repeater warning light (13, figure 1-9) is located on the pilots' instrument panel directly above the repeater switch. In the event of normal power failure the light will illuminate indicating that emergency power is needed to operate the direction indicator repeater. The repeater power circuit is protected by a fuse or circuit breaker on the AC power panel.

AC Voltage and Frequency Selector Switch, Voltmeter and Frequency Meter

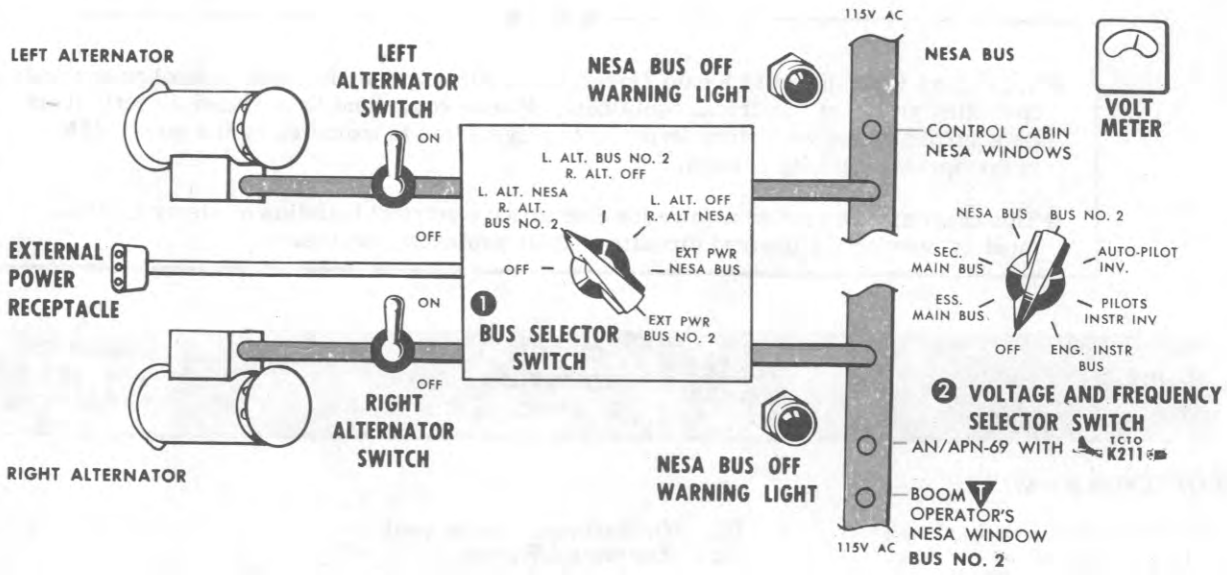
A rotary-type switch (41, figure 1-22); a single alternating-current voltmeter (36, figure 1-22) and a single frequency meter (37, figure 1-22) on the engineer's instrument panel provide a means of reading the output voltage and frequency of each 400 cycle inverter and voltage only of variable frequency alternators, as selected by the switch. The switch has OFF--ESS MAIN BUS--SEC MAIN BUS--NESA BUS--BUS NO. 2--AUTOPILOT INV--PILOTS INSTR INV--ENG INSTR BUS positions. The voltmeter and frequency meter are connected to the power sources as indicated by the switch position, except that the frequency meter is not connected when the switch is in the NESA BUS--BUS NO. 2 ENG INSTR BUS positions. When the switch is in the OFF position neither the AC voltmeter or frequency meter are connected to a power source.

Inverter Changeover Relay Test Switches

These switches (figure 1-34) with TEST--OFF positions, are located on the AC power panel, except on airplanes 3142 ▶ the autopilot inverter changeover relay test switch is located on the autopilot junction shield. This shield is across from the engineer's position on the left side of the airplane near the floor. Each switch is spring-loaded from the TEST position to the OFF position. In the circuits, the changeover relay test switches are located between the AC buses and the changeover relays. In normal operation these switches allow a voltage to be impressed upon the relays when the inverters are in operation. To test a changeover relay, the inverter must be operating and supplying 115 volts AC to the AC bus and the switch must be held in the TEST position for four seconds. This allows time for the circuit to be broken and a heating element to be connected to the main 28 volt DC bus which causes a bimetallic switch to close a circuit to a relay which in turn energizes the spare inverter.

VARIABLE FREQUENCY AC POWER SYSTEM

The variable frequency AC power system provides power for the Nesa windows in the control cabin, and on Code T airplanes in the boom operator's compartment. See figure 1-32 for a schematic diagram of the variable frequency AC power system.



115V AC FROM ALTERNATOR

1 Power flow shown with bus selector switch in L ALT NESA, R ALT BUS No. 2 position

2 The frequency meter is inoperative if switch is positioned to NESA BUS or BUS No. 2

VARIABLE FREQUENCY AC POWER GENERATION AND DISTRIBUTION

Figure 1-32

Alternators

Two alternating current generators, one on each inboard engine, supply power through 100 ampere fuses located in the nacelle solenoid panel to the Nesa bus and bus No. 2.

ALTERNATOR SWITCHES

The two alternators are controlled by two ON--OFF switches (38, figure 1-22) on the engineer's instrument panel. When the switches are in the ON position and the engines are running, alternating current of unregulated frequency is delivered to the bus selector switch. The control circuit for each alternator is protected by a circuit breaker on the overhead circuit breaker panel (figure 1-34).

AC External Power Receptacle

An external power receptacle (20, figure 1-47) for variable frequency alternating-current power is in the forward end of the nose wheel well.

Bus Selector Switch

This rotary-type switch (40, figure 1-22), on the engineer's instrument panel, has OFF--L. ALT. NESA-R. ALT. BUS NO. 2--L. ALT. BUS NO. 2-R. ALT. OFF--L. ALT. OFF-R. ALT. NESA--EXT PWR NESA BUS--EXT PWR BUS NO. 2 positions. It directs variable frequency alternating current from the external AC power receptacle or from left or right alternators to the Nesa bus or No. 2 bus as indicated by the switch position. When the switch is in the OFF position, no variable frequency AC power is connected to the busses. Unmarked switch positions are also OFF positions.

Nesa Bus Off Warning Lights

There are two red push-to-test alternator warning lights (39, figure 1-22) on the engineer's instrument panel. The warning lights for the Nesa and No. 2 bus are DC powered. The light for the respective bus will illuminate if that bus does not receive alternator power when the bus selector switch is placed in a position which would energize the bus.

NOTE

- This chart is designed to locate circuit protection devices for both control power and operating power of electrical equipment. Where equipment is operated directly from its control and one protection device is employed, this is indicated by the word "SAME" in the operating power column.
- This chart may be used as a guide for emergency electrical isolation of electrical equipment by opening the desired circuits at their protective devices.

CIRCUIT TITLE	CONTROL POWER	CIRCUIT PROTECTION LOCATION	OPERATING POWER	CIRCUIT PROTECTION LOCATION
AIR REFUELING SYSTEM				
A-1 hydraulic oil temperature	DC	Overhead circuit breaker panel	Same	
A-1 pump control	DC	Engineer's A/R panel	Same	
A/R director light test			DC	Aft power panel
A/R dump (Emergency)	DC	Forward power panel	Same	
A/R power			DC	Aft power panel
A/R tank purge 17260 ▶ 3195 less TCTO KG516	DC	Forward power panel	Same	
Auto fuel bypass valve			DC	Engineer's A/R panel
Manifold transfer valve	DC	Engineer's A/R panel	Same	
Fuel flow totalizer	AC	Engineer s A/R panel	Same	
Gravity fuel dump	DC	Engineer's A/R panel	Same	
Hydraulic pressure gauges 2894 ▶			AC	Engineer's A/R panel
Indicator light test			DC	Aft power panel
Poppet control	DC	Engineer's A/R panel	Same	
Pressure fuel dump	DC	Engineer's A/R panel	Same	
Signal amplifier	DC	Aft power panel A/R	DC	Boom operator's panel
ANTI-ICING				
Anti-ice and air conditioning fuel supply valves	DC	Overhead circuit breaker panel	Same	
Body and Surface Anti-icing heaters	DC	Overhead circuit breaker panel	Same	
Body and Surface Anti-icing heater fuel valves	DC	Overhead circuit breaker panel (Uses heat control circuit protection)	Same AC	 AC power panel
Body and Surface Anti-icing heater ignition				
Emergency anti-icing	DC	Forward power panel	Same	
Empennage ground blower		(Uses empennage heat control circuit protection)	DC	Aft power panel
Heater fuel valve	DC	Forward power panel	Same	
Overheat test	DC	Forward power panel	Same	
Pitot heat; Pitot heat (Copilot's)	DC	Overhead panel	Same	
Pitot heat - (Pilot's) Normal & Emergency	DC	Forward power panel	Same	
Propeller deice	DC	Overhead circuit breaker panel	DC	Main power panel
Ruddevator anti-ice 17260 ▶ 3249 less TCTO K509	DC	Engineer's A/R panel	DC	Main power panel
Window heat	DC	Overhead circuit breaker panel	AC	Alternator relay shield
	AC	Alternator relay shield 17260 ▶ 17271		
	AC	AC power panel 2826 ▶ 2859		
Window heat (Boom operator's)	DC	Overhead circuit breaker panel	AC	Alternator relay shield
	DC	Boom operator's panel		
AUTOPILOT				
Autopilot inverters	DC	Overhead circuit breaker panel	DC	Forward power panel
Autopilot	DC	Overhead circuit breaker panel	AC	AC power panel
N-1 compass system		(Uses autopilot circuit protection)		

CIRCUIT PROTECTION AND LOCATION

Figure 1-33 (Sheet 1 of 4)

CIRCUIT TITLE	CONTROL POWER	CIRCUIT PROTECTION LOCATION	OPERATING POWER	CIRCUIT PROTECTION LOCATION
CABIN HEATING, VENTILATING, AND PRESSURIZING SYSTEMS				
Body heaters	DC	Forward power panel		
Body heater fuel valves	DC	Forward power panel	Same	
Body heater ignition		(Uses body heat control circuit protection)	AC	AC power panel
Cabin air bleed	DC	Overhead circuit breaker panel	Same	
Cabin pressure control	DC	Forward power panel	Same	
Control cabin fans	DC	Overhead circuit breaker panel	Same	
Ground blowers	DC	Forward power panel	DC	Main circuit breaker panel
Overheat test	DC	Forward power panel	Same	
CARGO				
Aerial delivery motor 17260 ▶ 22628	DC	Aft power panel	DC	Main power panel
Cargo door	DC	Aft power panel	DC	Aft power panel
Cargo hoist	DC	Cargo hoist shield	DC	Forward power panel
	DC	Forward power panel 22629 ▶ 22736		
COMMUNICATIONS AND ASSOCIATED ELECTRONIC EQUIPMENT				
IFF radio destruction, without TCTO 590	DC	Forward power panel		
Power distribution			AC	AC power panel
			DC	Forward power panel
Radio and radar equipment	AC	Radio junction box circuit breaker panel	Same	
	DC	Radio junction box circuit breaker panel		
VHF navigation radio (omni)	DC	Aft power panel Aft radio rack junction box		
UHF navigation radio (tacan) TCTO K572	DC	Radio junction box circuit breaker panel	AC	Radio junction box circuit panel
ELECTRICAL SYSTEM				
Alternators	DC	Overhead circuit breaker panel		
Auxiliary power unit	DC	Auxiliary power unit shield		
Battery control	DC	Forward power panel	Same	
Generators	DC	Main circuit breaker panel		
Generator field relays	DC	Overhead circuit breaker panel	Same	
Inverters	DC	Overhead circuit breaker panel	DC	Forward power panel
Voltmeters	AC	AC power panel and alternator relay shield	Same	
	DC	Main circuit breaker panel	Same	
ENGINES				
Carburetor preheat valve	DC	Overhead circuit breaker panel	Same	
Carburetor sheltered air door	DC	Overhead circuit breaker panel	DC	Main circuit breaker panel
Cowl flaps	DC	Overhead circuit breaker panel	DC	Main circuit breaker panel
Engine instruments			AC	AC power panel
			DC	Overhead circuit breaker panel
Exhaust back pressure switch 3196 ▶ plus TCTO 338	DC	Overhead circuit breaker panel	Same	
Ignition analyzer	DC	Overhead circuit breaker panel Control panel and analyzer	AC	AC power panel
Ignition booster	DC	Overhead circuit breaker panel	Same	
Intercooler flaps	DC	Overhead circuit breaker panel	Same	
Oil cooler flaps	DC	Overhead circuit breaker panel	Same	
Primer	DC	Overhead circuit breaker panel	Same	
Spark advance	DC	Overhead circuit breaker panel	Same	
Starters	DC	Overhead circuit breaker panel	DC	Main power panel
Turbosuperchargers	AC	AC power panel	Same	
Water injection	DC	Overhead circuit breaker panel	DC	Main circuit breaker panel

Figure 1-33 (Sheet 2 of 4)

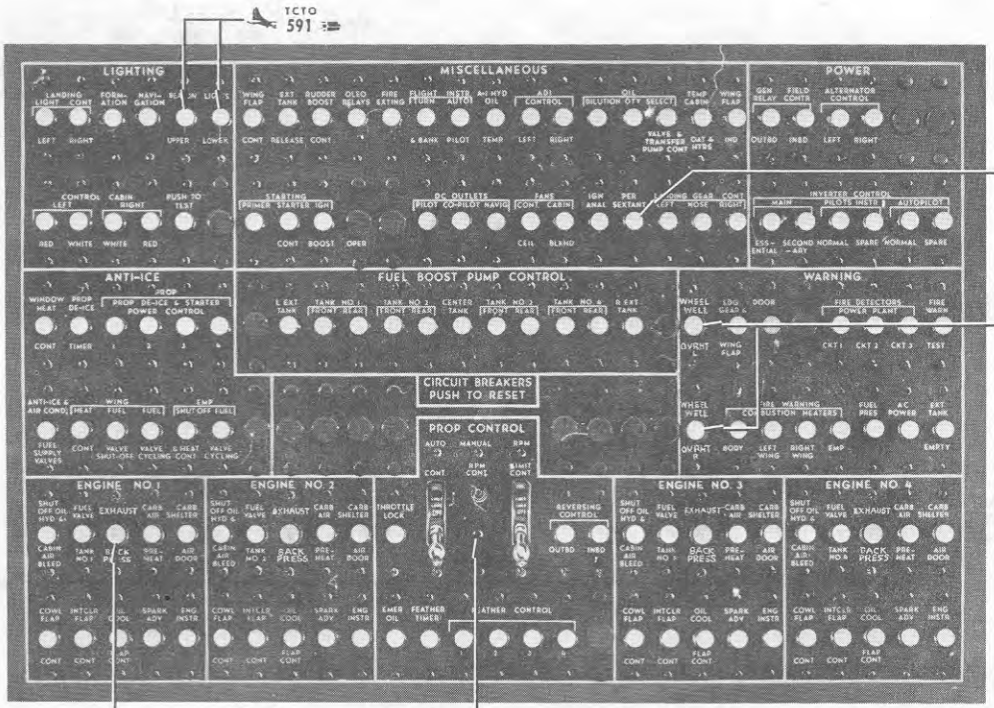
CIRCUIT TITLE	CONTROL POWER	CIRCUIT PROTECTION LOCATION	OPERATING POWER	CIRCUIT PROTECTION LOCATION
FIRE EXTINGUISHING				
Body and Surface Anti-icing heater fire warning	DC	Overhead circuit breaker panel	Same	
Fire detector			DC	Overhead circuit breaker panel
Fire extinguishing	DC	Overhead circuit breaker panel		
Fire warning test	DC	Overhead circuit breaker panel	Same	
FLIGHT CONTROLS				
Emergency wing flaps	DC	Main circuit breaker panel	DC	Main power panel
Rudder boost	DC	Overhead circuit breaker panel		
Wing flaps	DC	Overhead circuit breaker panel	DC	Main power panel
FUEL SYSTEM				
T A/R line valve	DC	Engineer's A/R panel	Same	
Boost pumps	DC	Overhead circuit breaker panel	DC	Main circuit breaker panel
Fuel gages			AC	AC power panel
T Fuel leveling valve (A/R)	DC	Engineer's A/R panel	Same	
Fuel pressure warning			DC	Overhead panel
Fuel selector valves	DC	Overhead circuit breaker panel	Same	
T Fuel shutoff valve (Emergency A/R)			DC	Engineer's A/R panel
T Fuel transfer valves (A/R)	DC	Engineer's A/R panel	Same	
Single point refueling	DC	Forward power panel	Same	
Single point secondary valve	DC	Single point refueling panel	Same	
HYDRAULIC SYSTEM				
Hydraulic pressure gage			AC	AC power panel
Hydraulic shutoff valve	DC	Overhead circuit breaker panel	Same	
INSTRUMENTS				
T Attitude Indicator			AC	AC power panel
Boom position indicator			DC	Boom operator's panel
Directional Indicator			AC	AC power panel
Engine instruments			AC	AC power panel
			DC	Overhead circuit breaker panel
Fuel gages			AC	AC power panel
Hydraulic pressure gage			AC	AC power panel
Temperature cabin, OAT and heater			DC	Overhead circuit breaker panel
Turn and slip indicator (Pilot's)			DC	Overhead circuit breaker panel
Turn and slip indicator (Copilot's)			AC	(Uses autopilot circuit protection)
Voltmeters	DC	Main power panel	Same	
Wing flap position indicator			DC	Overhead circuit breaker panel
LANDING GEAR				
Main landing gear	DC	Overhead circuit breaker panel	DC	Main power panel
Nose landing gear	DC	Overhead circuit breaker panel	DC	Forward power panel
Oleo relays			DC	Overhead circuit breaker panel
Portable auxiliary motor		Uses emergency wing flap circuit protection)		
Warning horn	DC	Overhead circuit breaker panel	Same	

CIRCUIT PROTECTION AND LOCATION (CONT)

Figure 1-33 (Sheet 3 of 4)

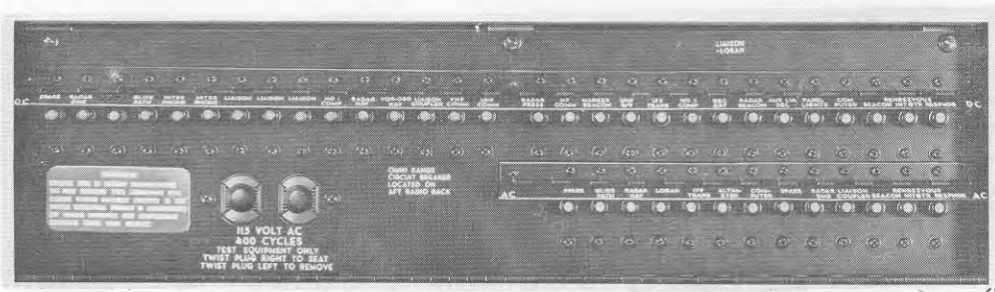
CIRCUIT TITLE	CONTROL POWER	CIRCUIT PROTECTION LOCATION	OPERATING POWER	CIRCUIT PROTECTION LOCATION
LIGHTING				
Anti-collision lights TCTO 591	AC	AC power panel	DC	Overhead circuit breaker panel
T Boom operator's lights	DC	Boom operator's panel	Same	
Control cabin	DC	Overhead circuit breaker panel	Same	
Control cabin entrance light	DC	Forward power panel	Same	
Engineer's refueling panel lights	DC	Overhead circuit breaker panel	Same	
T Exterior lights (A/R)	DC	Boom operator's panel	Same	
Fluorescent lights 17260 ▶ 3267	AC	AC power panel	Same	
Formation lights	DC	Overhead circuit breaker panel	Same	
Landing lights	DC	Overhead circuit breaker panel	DC	Main circuit breaker panel
Lower aft compartments	DC	Main circuit breaker panel	Same	
Lower forward compartments	DC	Forward power panel	Same	
Main cargo compartment	DC	Main circuit breaker panel	Same	
Miscellaneous lights	DC	Overhead panel	Same	
Navigation lights	DC	Overhead circuit breaker panel	Same	
Pilot director lights TCTO K526	DC	Boom operator's panel	DC	Aft power panel
T Rendezvous beacon lights 3196 ▶ PLUS TCTO K231	DC	Boom operator's panel	Same	
MISCELLANEOUS				Overhead circuit breaker panel Main circuit breaker panel
DC outlets				
Driftmeter	AC	AC power panel	Same	
Emergency alarm	DC	Forward power panel	Same	
External tank release	DC	Overhead circuit breaker panel	Same	
Landing flare release	DC	Forward power panel	Same	
Periscopic sextant 2860 ▶ plus TCTO 133	DC	Overhead circuit breaker panel	Same	
Suit heaters 17260 ▶ 2859	DC	Overhead circuit breaker panel	Same	
NOSE STEERING SYSTEM				
Nose steering emergency valve	DC	Forward power panel	Same	
OIL SYSTEMS				
Oil dilution	DC	Overhead circuit breaker panel		
Oil quantity gage			DC	Overhead circuit breaker panel
Oil shutoff valves	DC	Overhead circuit breaker panel	Same	
Oil transfer pump	DC	Overhead circuit breaker panel	DC	Forward power panel
PROPELLERS				
Auto RPM	DC	Overhead circuit breaker panel		
Emergency oil	DC	Overhead circuit breaker panel	DC	Main power panel
Feathering	DC	Overhead circuit breaker panel	DC	Main power panel
Manual RPM	DC	Overhead circuit breaker panel		
Reversing	DC	Overhead circuit breaker panel		
RPM limit	DC	Overhead circuit breaker panel		
Throttle lock	DC	Overhead circuit breaker panel	Same	
WARNING INDICATORS				
AC power			DC	Overhead circuit breaker panel
Body and surface anti-icing heater fire	DC	Overhead circuit breaker panel	Same	
Cargo discharge signal 17260 ▶ 22628	DC	Overhead circuit breaker panel	Same	
Door closed			DC	Overhead circuit breaker panel
External tank low	DC	Overhead circuit breaker panel	Same	
Fuel flow (tank empty)			DC	Overhead circuit breaker panel
Fire detectors			DC	Overhead circuit breaker panel
Fire detector test	DC	Overhead circuit breaker panel	Same	
T Fuel and hydraulic pressure (A/R)			DC	Engineer's A/R panel
Fuel pressure			DC	Overhead circuit breaker panel
T Fuel quantity gage test (A/R)	DC	Engineer's A/R panel	Same	
Landing gear and wing flaps			DC	Overhead circuit breaker panel
Wheel well overheat TCTO 558			DC	Overhead circuit breaker panel

Figure 1-33 (Sheet 4 of 4)



OVERHEAD CIRCUIT BREAKER PANEL

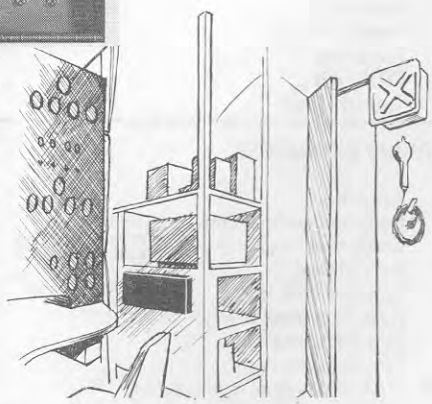
DETAIL I
WITHOUT TCTO 531



22701 ▶

RADIO JUNCTION BOX CIRCUIT BREAKER PANEL (TYPICAL)

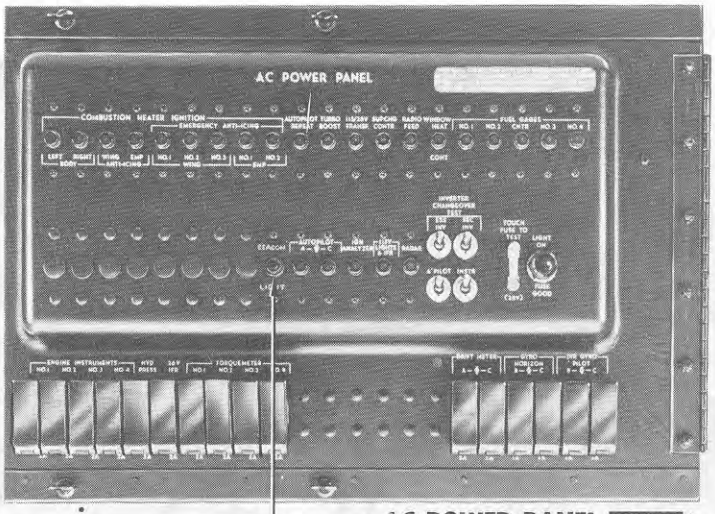
NOTE: FUSES ARE USED FOR AC PROTECTION ON 17260 ▶ 22700



CIRCUIT BREAKER PANELS LOCATION (TYPICAL)

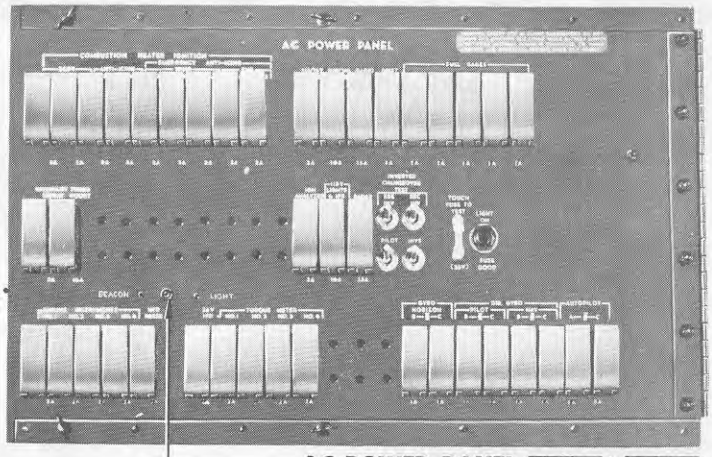
Figure 1-34 (Sheet 1 of 6)

CARGO HOIST SHIELD



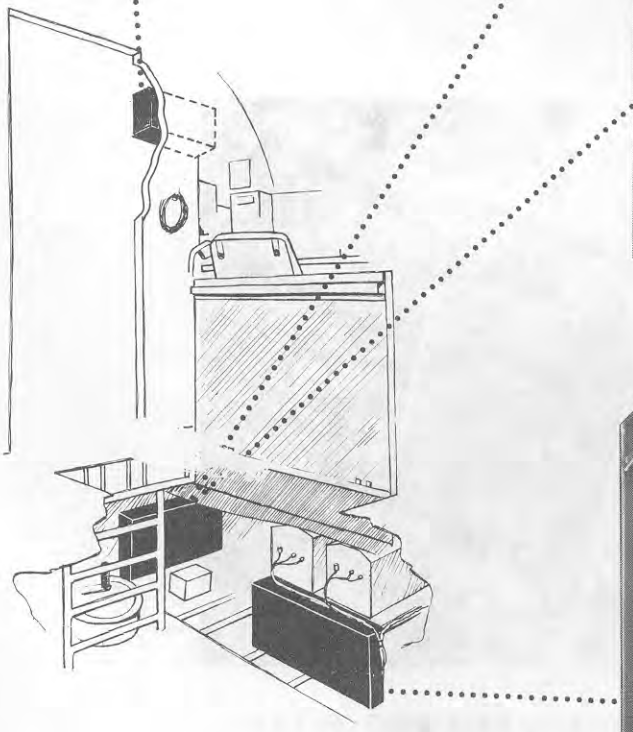
TCTO 591

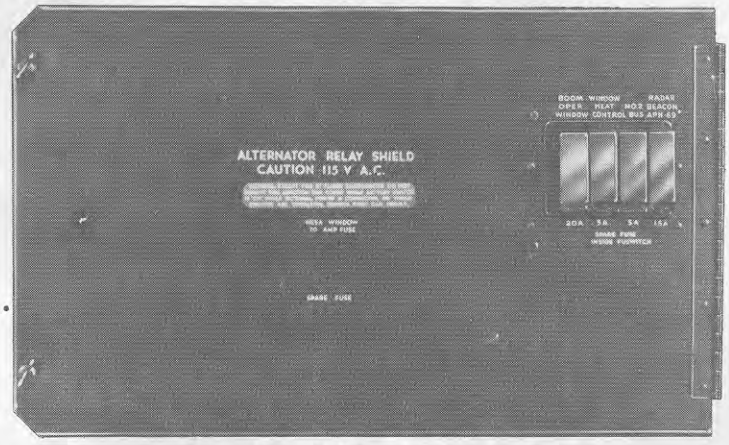
AC POWER PANEL 22701 ▶



TCTO 591

AC POWER PANEL 17260 ▶ 22700

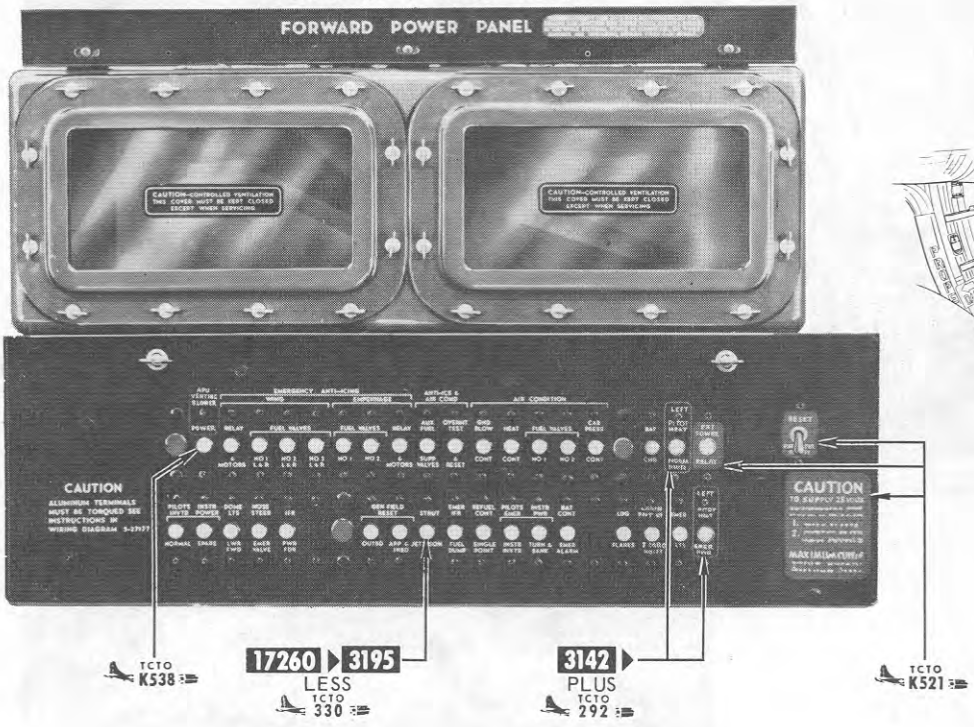


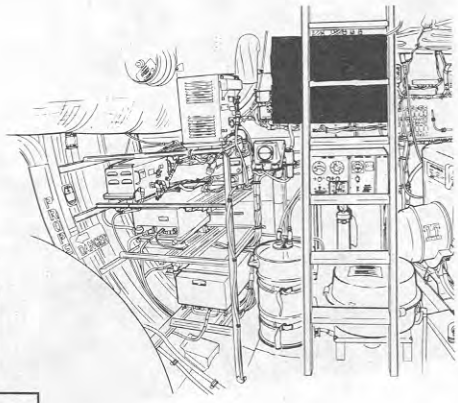


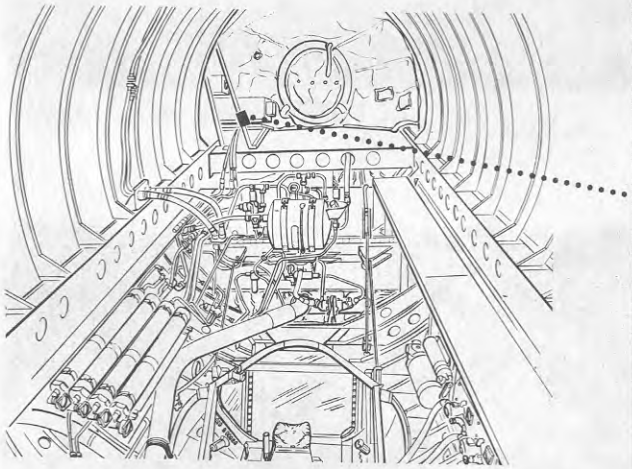
ALTERNATOR RELAY SHIELD 2826 ▶

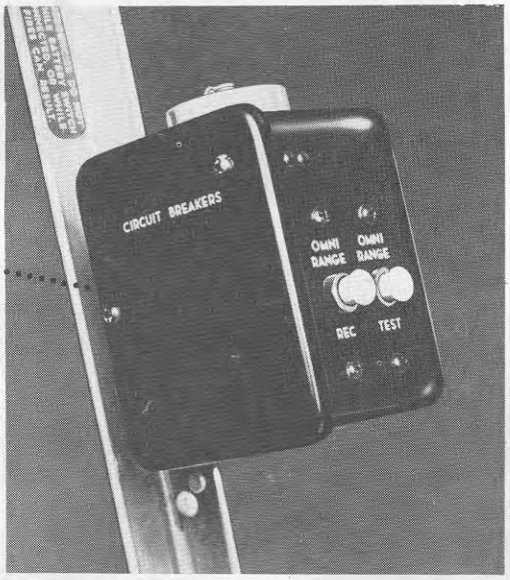
Figure 1-34 (Sheet 2 of 6)

FORWARD POWER PANEL





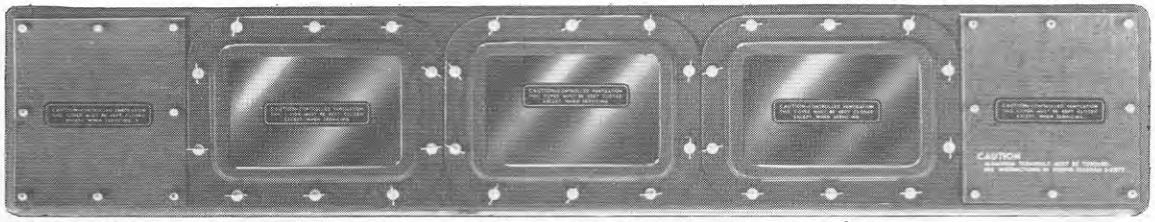




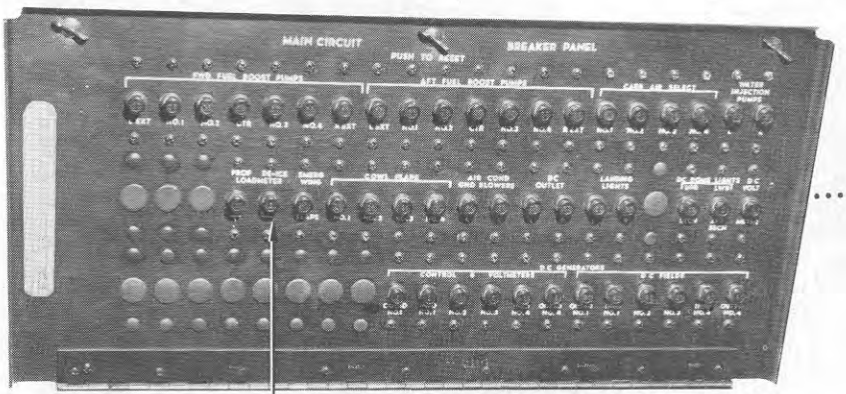
AFT RADIO RACK JUNCTION BOX

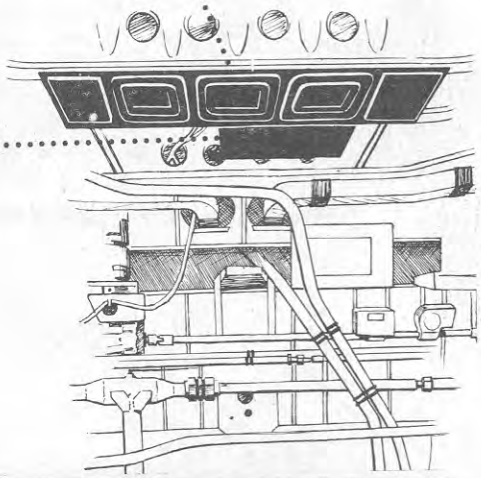
CIRCUIT BREAKER PANELS LOCATION (CONT)

Figure 1-34 (Sheet 3 of 6)

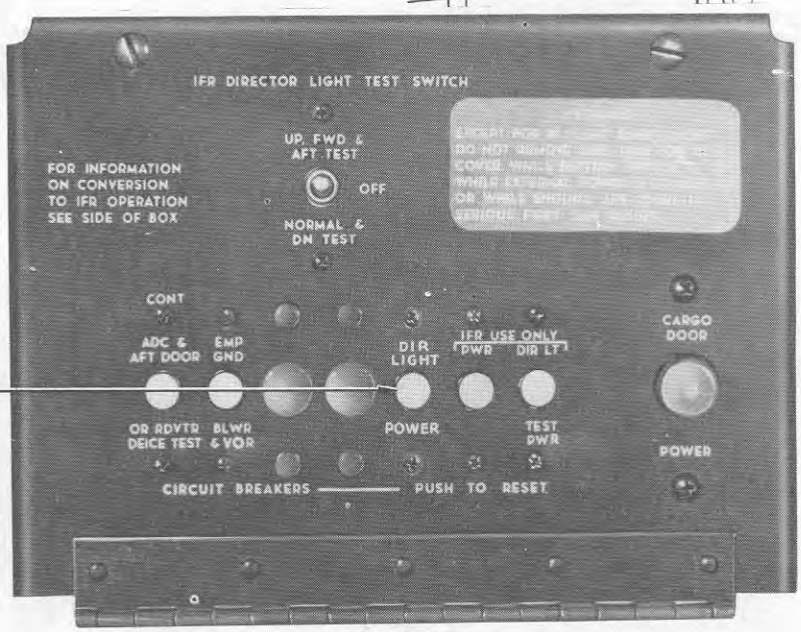


MAIN POWER PANEL



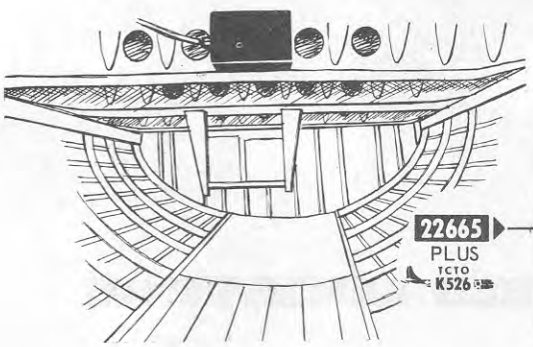


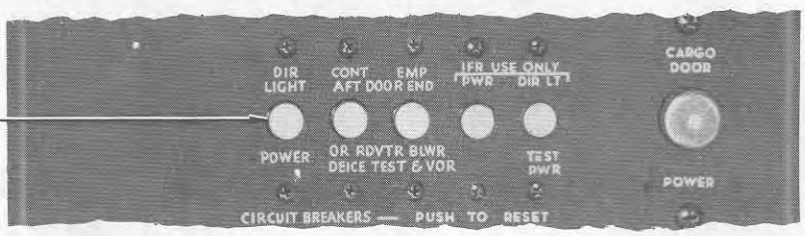
22629 ▶
PLUS
TCTO 534



17260 ▶ 22664
PLUS
TCTO K526

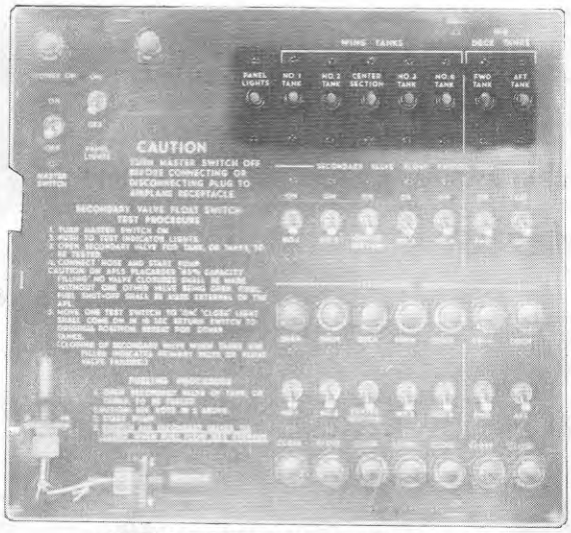
AFT POWER PANEL



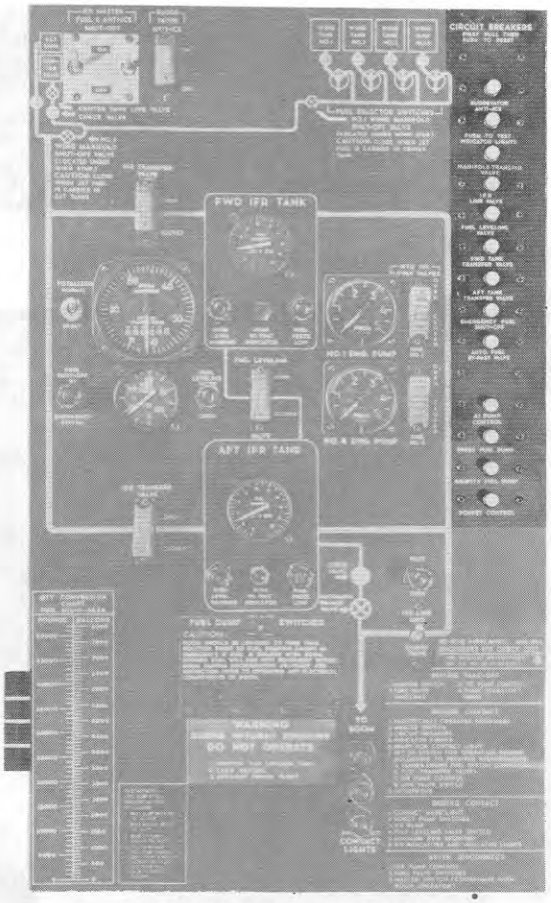


22665 ▶
PLUS
TCTO K526

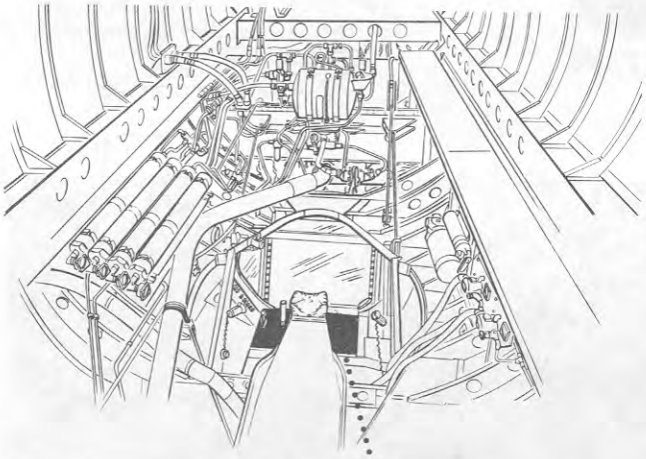
Figure 1-34 (Sheet 4 of 6)

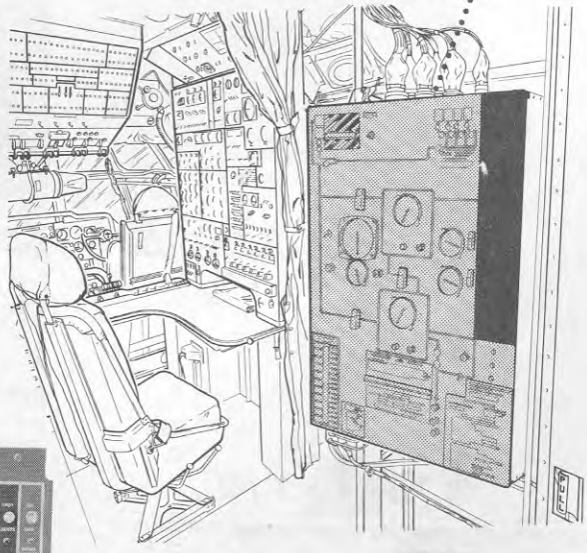


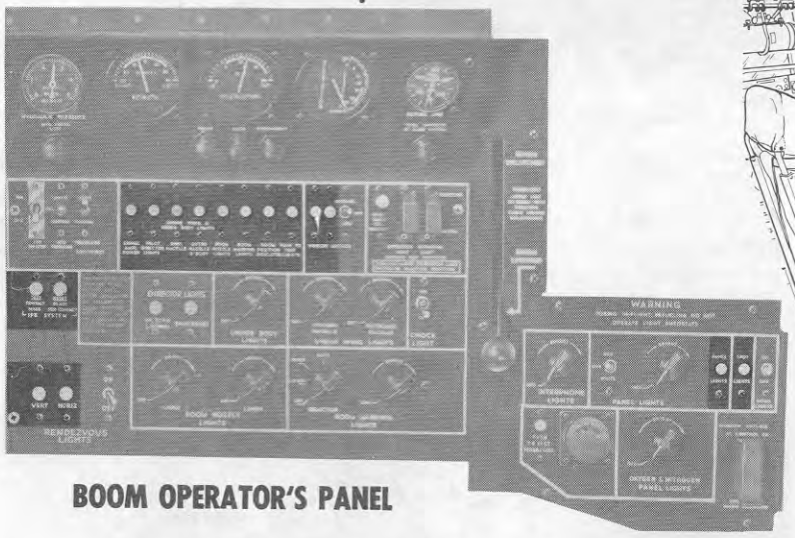
SINGLE POINT REFUELING PANEL



ENGINEER'S A/R PANEL



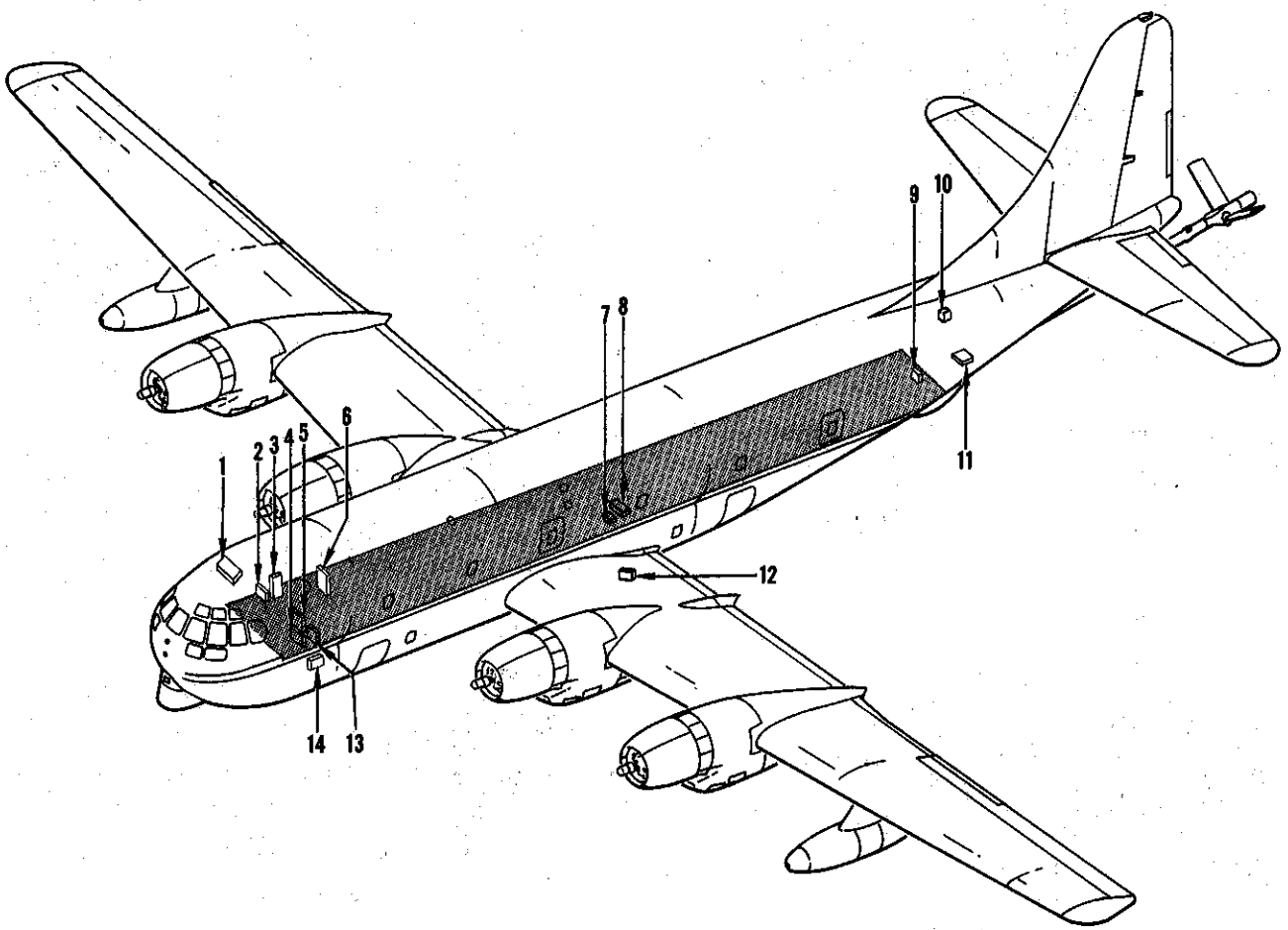




BOOM OPERATOR'S PANEL

CIRCUIT BREAKER PANELS LOCATION (CONT)

Figure 1-34 (Sheet 5 of 6)



1 OVERHEAD CIRCUIT BREAKER PANEL (DC)
2 RADIO JUNCTION BOX CIRCUIT BREAKER PANEL (AC-DC)
3 ENGINEER'S A/R PANEL (AC-DC)
4 AUXILIARY POWER UNIT CONTROL PANEL (DC)
5 FORWARD POWER PANEL (DC)
6 CARGO HOIST SHIELD (DC)
7 MAIN CIRCUIT BREAKER PANEL (DC)
8 MAIN POWER PANEL (DC)
9 AFT POWER PANEL (DC)
10 AFT RADIO RACK JUNCTION BOX (DC)
11 BOOM OPERATOR'S PANEL (AC-DC) T
12 SINGLE POINT REFUELING PANEL (DC)
13 AC POWER PANEL
14 ALTERNATOR RELAY SHIELD (AC) 2826 ▶

Figure 1-34 (Sheet 6 of 6)