D-7490

PILOT'S HANDBOOK

YC-97 AIRPLANE

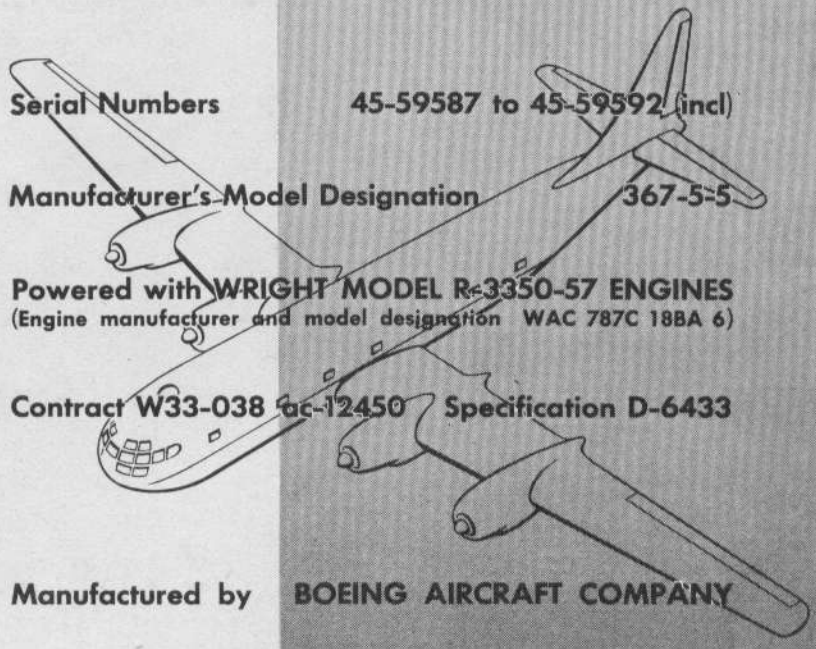
BOEING
AIRCRAFT COMPANY

SEATTLE, WASHINGTON

PILOTS HANDBOOK

FLIGHT OPERATING INSTRUCTIONS FOR

YC-97 AIRPLANE



Serial Numbers 45-59587 to 45-59592 (incl)

Manufacturer's Model Designation 367-5-5

Powered with WRIGHT MODEL R-3350-57 ENGINES
(Engine manufacturer and model designation WAC 787C 18BA 6)

Contract W33-038 ac-12450 Specification D-6433

Manufactured by BOEING AIRCRAFT COMPANY

Approved by Chief, Engineering Division_____
Date_____

JANUARY 15, 1947
17942

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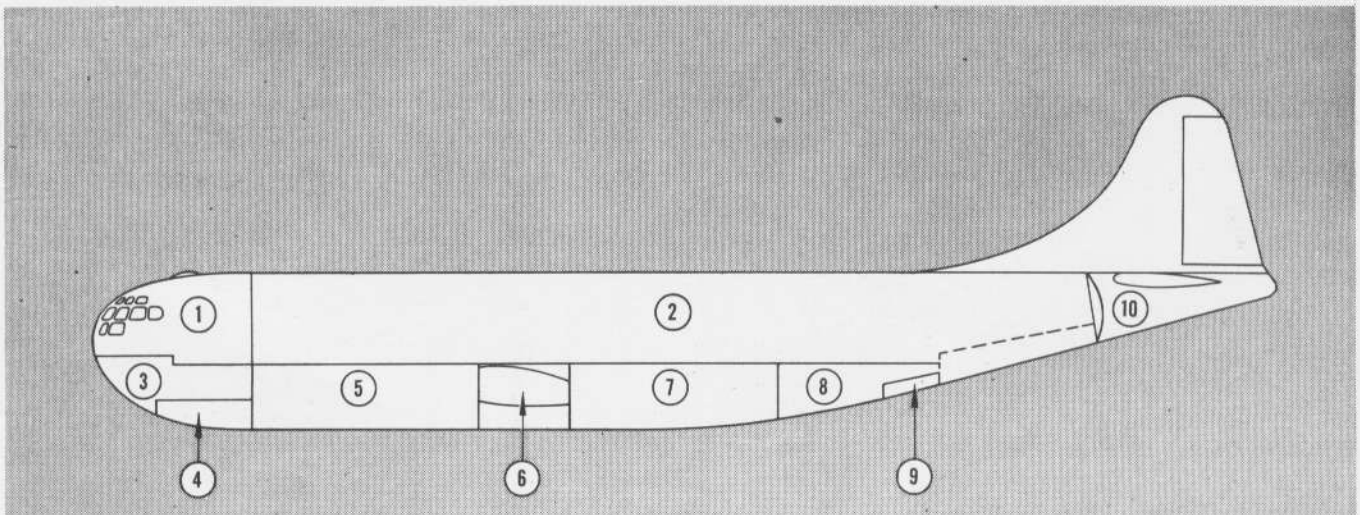
YC — 97 AIRPLANE

Section I

DESCRIPTION

1-1. AIRPLANE, GENERAL

1-2. The YC-97 airplane is a double-deck, four engine, cargo and troop carrying transport capable of long-range flights and having a design gross weight of 120,000 pounds. This airplane will carry approximately 41,000 pounds of cargo or 134 fully-equipped troops or 83 stretcher casualties with medical attendants and supplies. It is powered with four turbosupercharged Wright R-3350-57, 18-cylinder fuel-injection engines. Each engine drives a four-bladed Curtiss electric, constant-speed propeller having full-feathering and reverse-pitch features. The electrically-retractible tricycle landing gear consists of dual-wheel nose and main gears and a tail skid, all of which use oleo shock struts. The main landing gears are equipped with dual duplex expander-type hydraulic brakes. The fuselage is furnished with complete heating, ventilating, and pressurizing equipment. The normal crew consists of pilot, copilot, engineer, navigator, and radio operator.



1. CONTROL CABIN
2. MAIN CARGO COMPARTMENT
3. LOWER NOSE COMPARTMENT
4. NOSE WHEEL WELL
5. LOWER FORWARD CARGO COMPARTMENT
6. CENTER WING SECTION
7. LOWER REAR CARGO COMPARTMENT
8. REAR STOWAGE COMPARTMENT
9. TAIL SKID WELL
10. TAIL COMPARTMENT

Figure 1-1. Compartment Diagram

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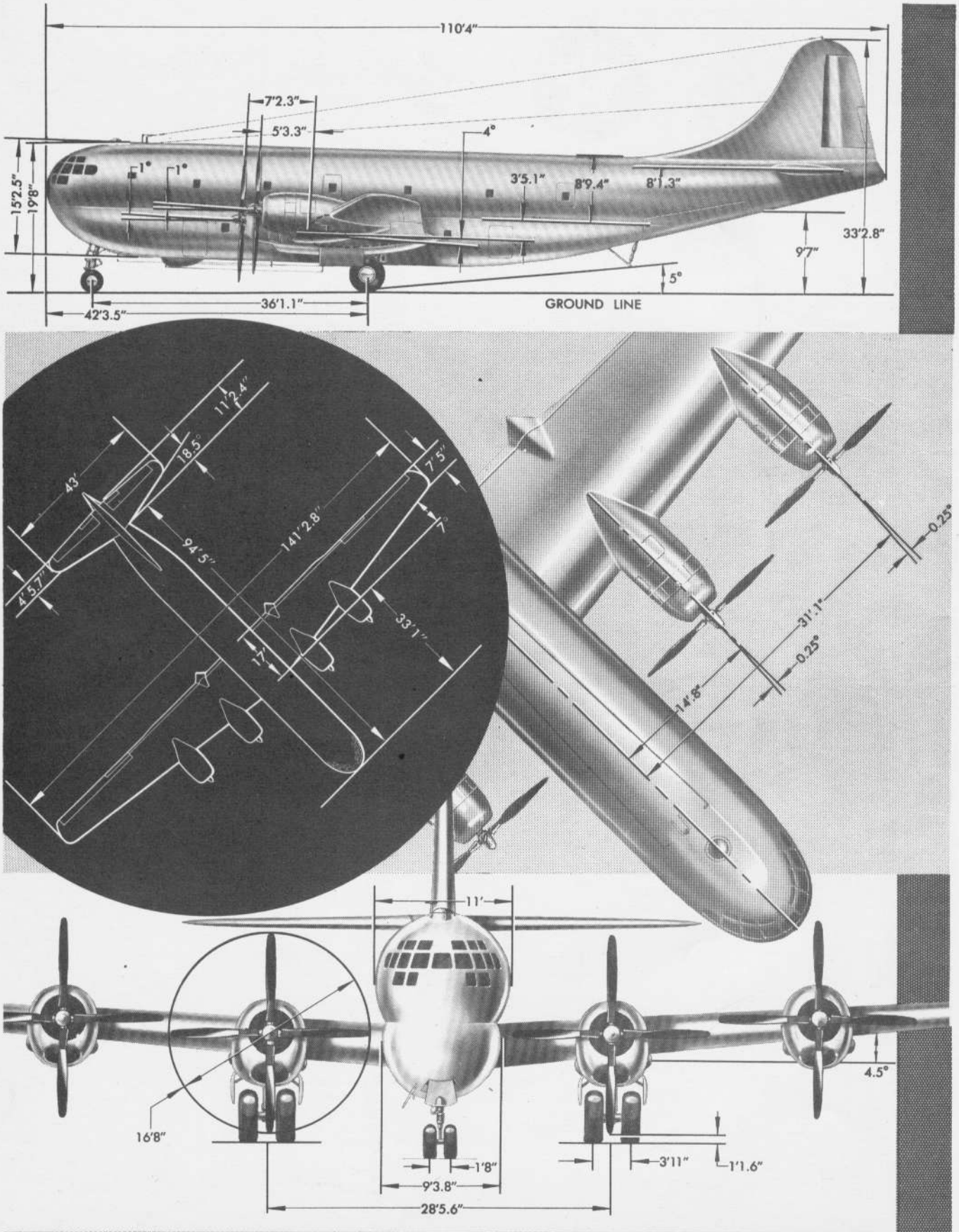

Figure 1-2. Principal Dimensions

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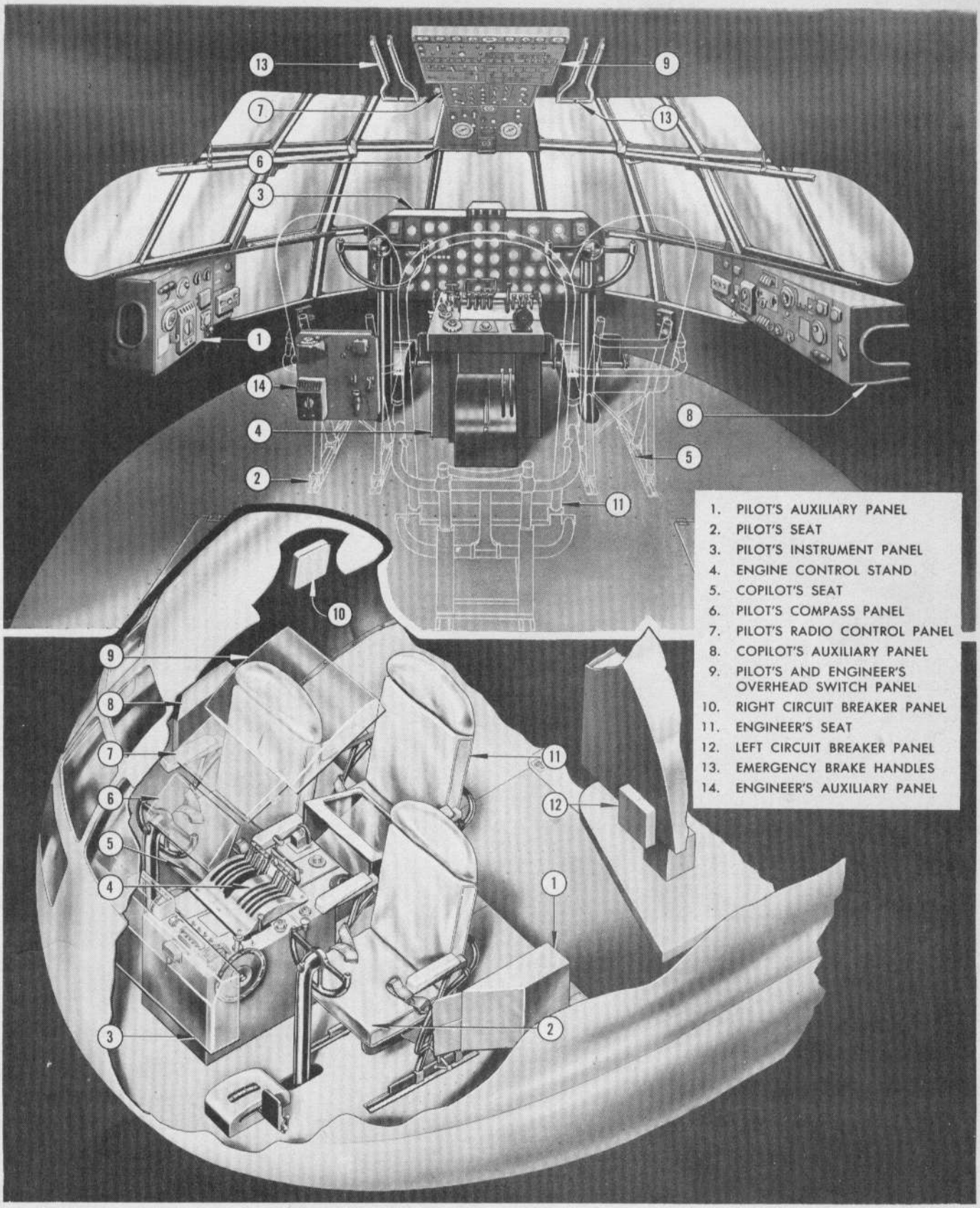

Figure 1-3. Control Cabin

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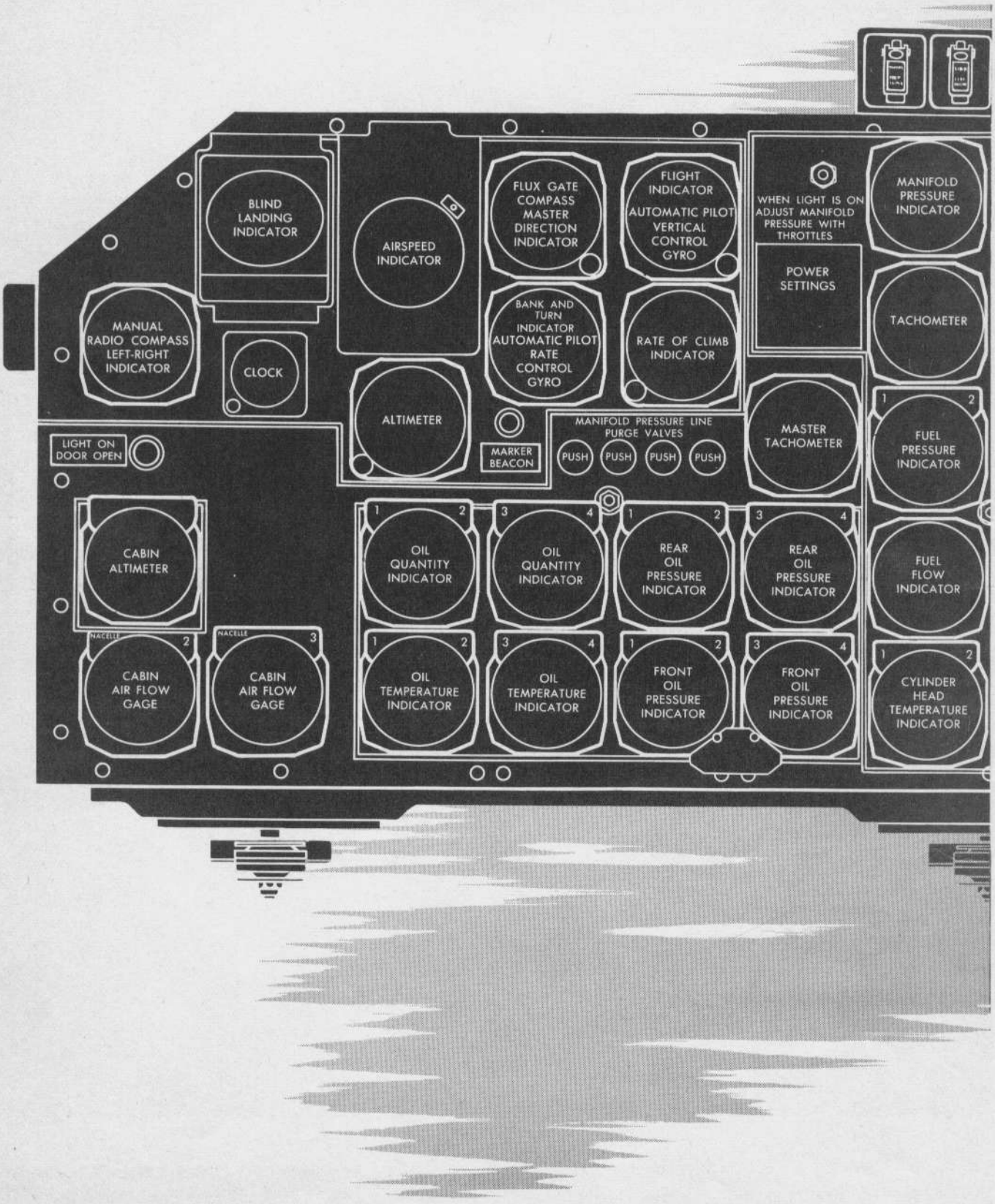

BLIND LANDING INDICATOR
AIRSPEED INDICATOR
FLUX GATE COMPASS MASTER DIRECTION INDICATOR
FLIGHT INDICATOR
AUTOMATIC PILOT VERTICAL CONTROL GYRO
WHEN LIGHT IS ON ADJUST MANIFOLD PRESSURE WITH THROTTLES
MANIFOLD PRESSURE INDICATOR
POWER SETTINGS
TACHOMETER
MANUAL RADIO COMPASS LEFT-RIGHT INDICATOR
CLOCK
BANK AND TURN INDICATOR
AUTOMATIC PILOT RATE CONTROL GYRO
RATE OF CLIMB INDICATOR
ALTIMETER
MARKER BEACON
MANIFOLD PRESSURE LINE PURGE VALVES
PUSH
PUSH
PUSH
PUSH
MASTER TACHOMETER
FUEL PRESSURE INDICATOR
LIGHT ON DOOR OPEN
CABIN ALTIMETER
OIL QUANTITY INDICATOR
OIL QUANTITY INDICATOR
REAR OIL PRESSURE INDICATOR
REAR OIL PRESSURE INDICATOR
FUEL FLOW INDICATOR
NACELLE
CABIN AIR FLOW GAGE
NACELLE
CABIN AIR FLOW GAGE
OIL TEMPERATURE INDICATOR
OIL TEMPERATURE INDICATOR
FRONT OIL PRESSURE INDICATOR
FRONT OIL PRESSURE INDICATOR
CYLINDER HEAD TEMPERATURE INDICATOR

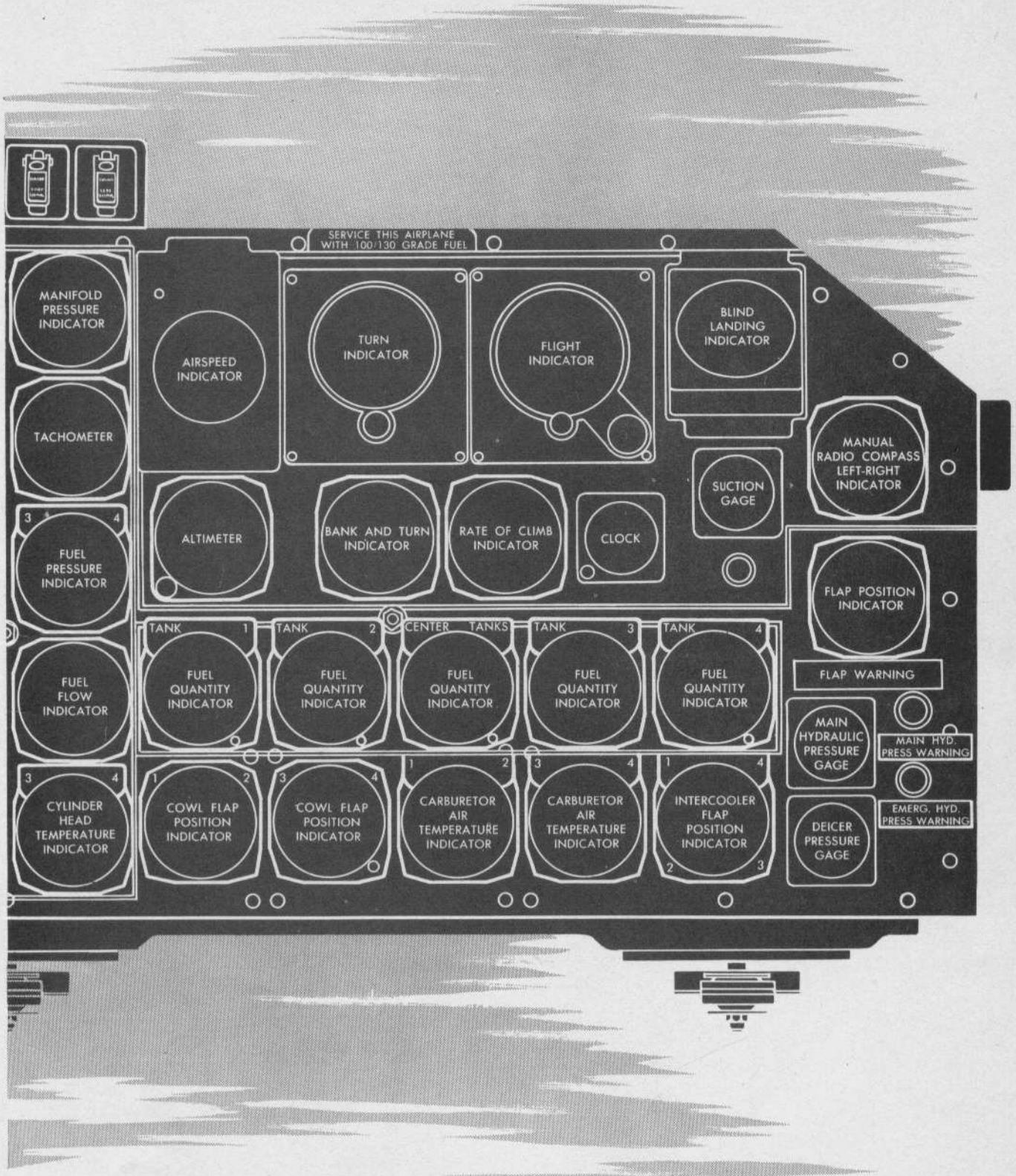


Figure 1-4. Pilots' Instrument Panel

LANDING GEAR WARNING LIGHTS

1. GREEN LIGHT ON—ALL LANDING GEAR DOWN AND LOCKED.
2. RED LIGHT ON—UNSAFE TO LAND.

LDG. GEAR SWITCH POSITION

DOWN: LANDING AND TAXIING
OFF: WHEN PARKED

TO LOCK CONTROL SURFACES

ELEVATOR MUST BE DOWN
RUDDER AND AILERONS MUST BE IN NEUTRAL
THROTTLES MUST BE CLOSED
RAISE LOCK HANDLE TO RELEASE
LEVER AND MOVE HANDLE AFT
UNTIL CATCH ENGAGES

NORMAL LDG. GEAR OPERATION

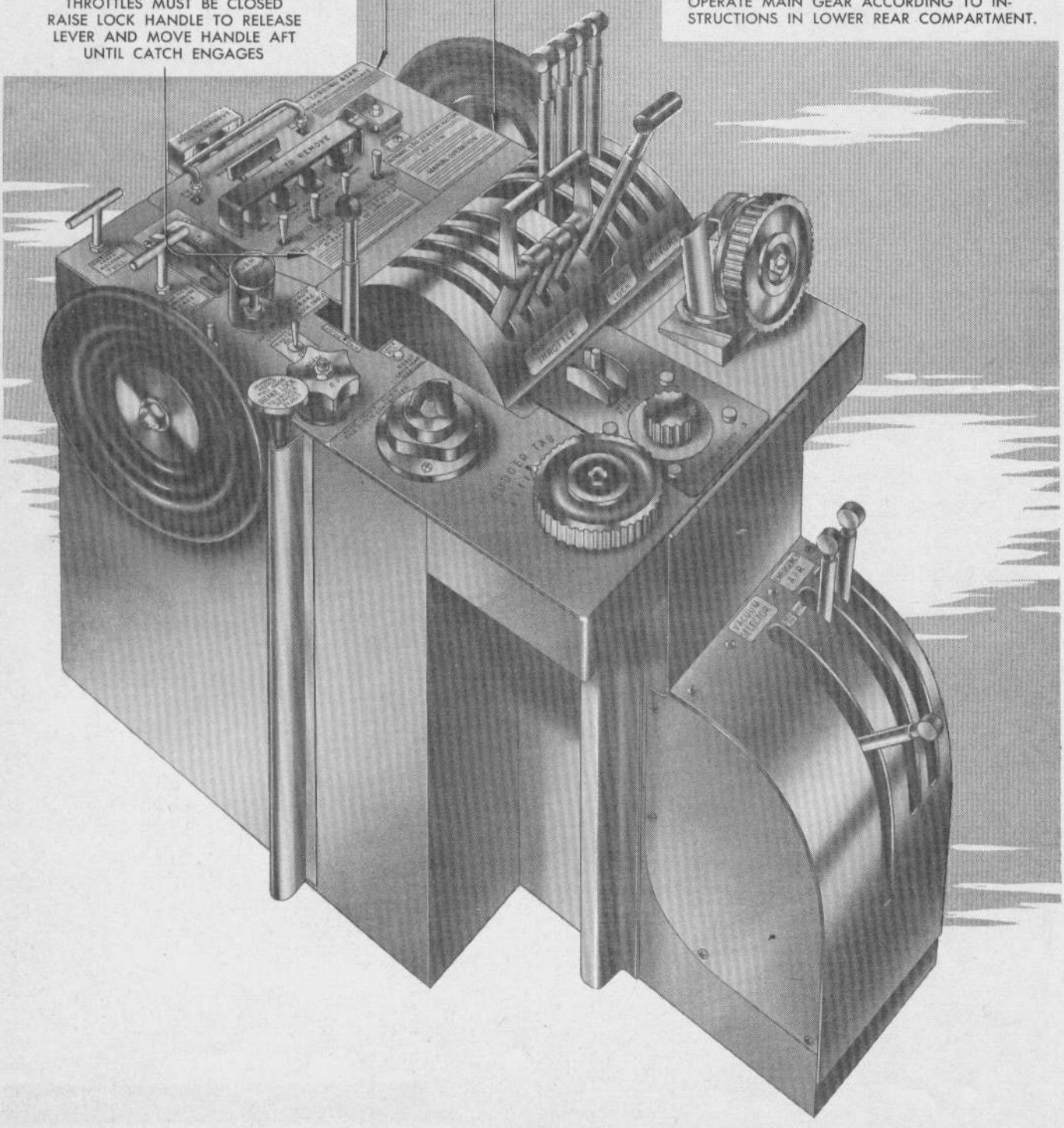
MOVE LANDING GEAR SWITCH TO DESIRED POSITION

CAUTION

DO NOT USE SWITCH UNLESS LANDING GEAR MOTOR CLUTCHES ARE ENGAGED ACCORDING TO INSTRUCTIONS IN LOWER NOSE AND LOWER REAR COMPARTMENTS.

MANUAL OPERATION

OPERATE NOSE GEAR ACCORDING TO INSTRUCTIONS IN LOWER NOSE COMPARTMENT.
OPERATE MAIN GEAR ACCORDING TO INSTRUCTIONS IN LOWER REAR COMPARTMENT.



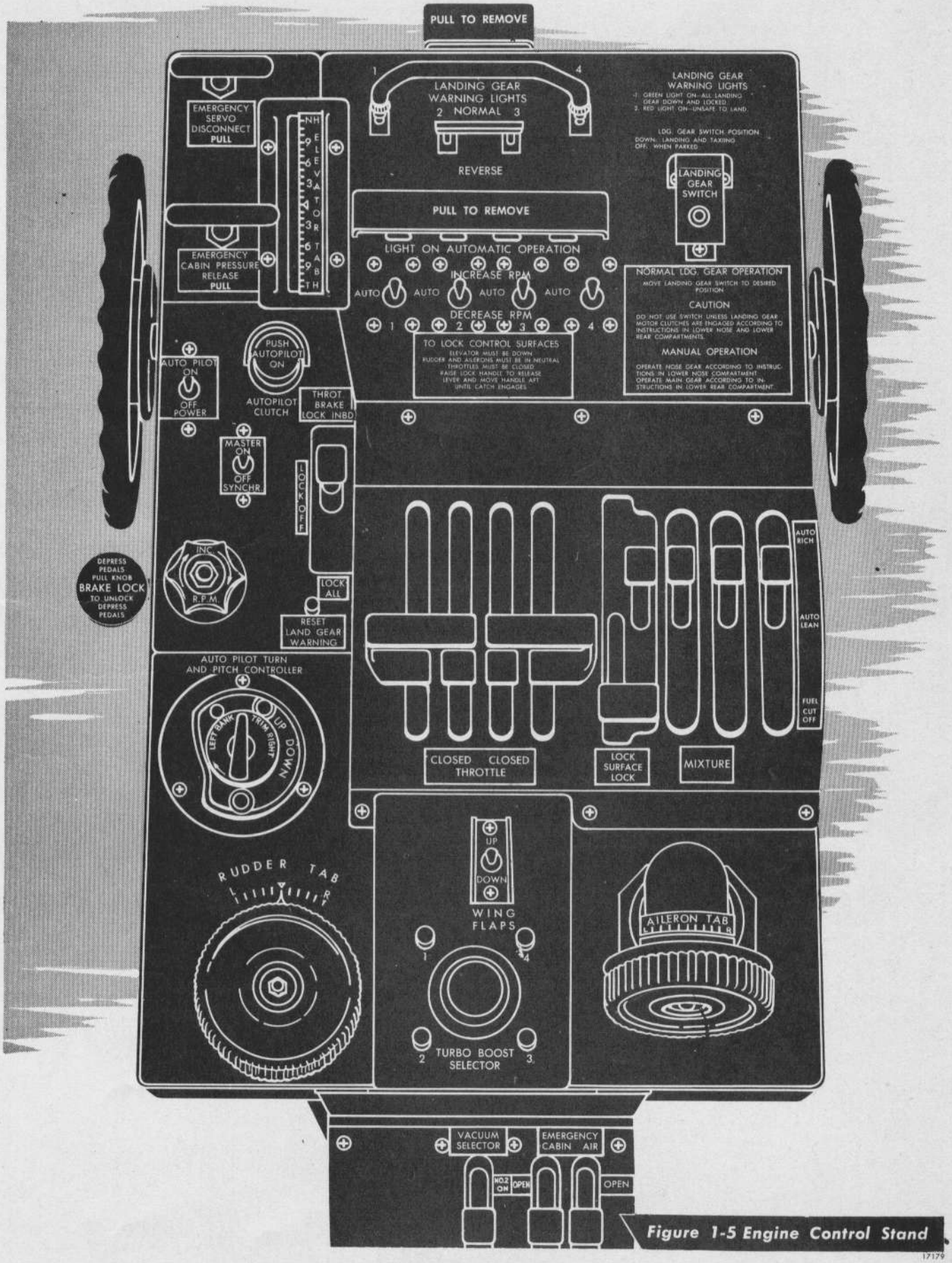


Figure 1-5 Engine Control Stand

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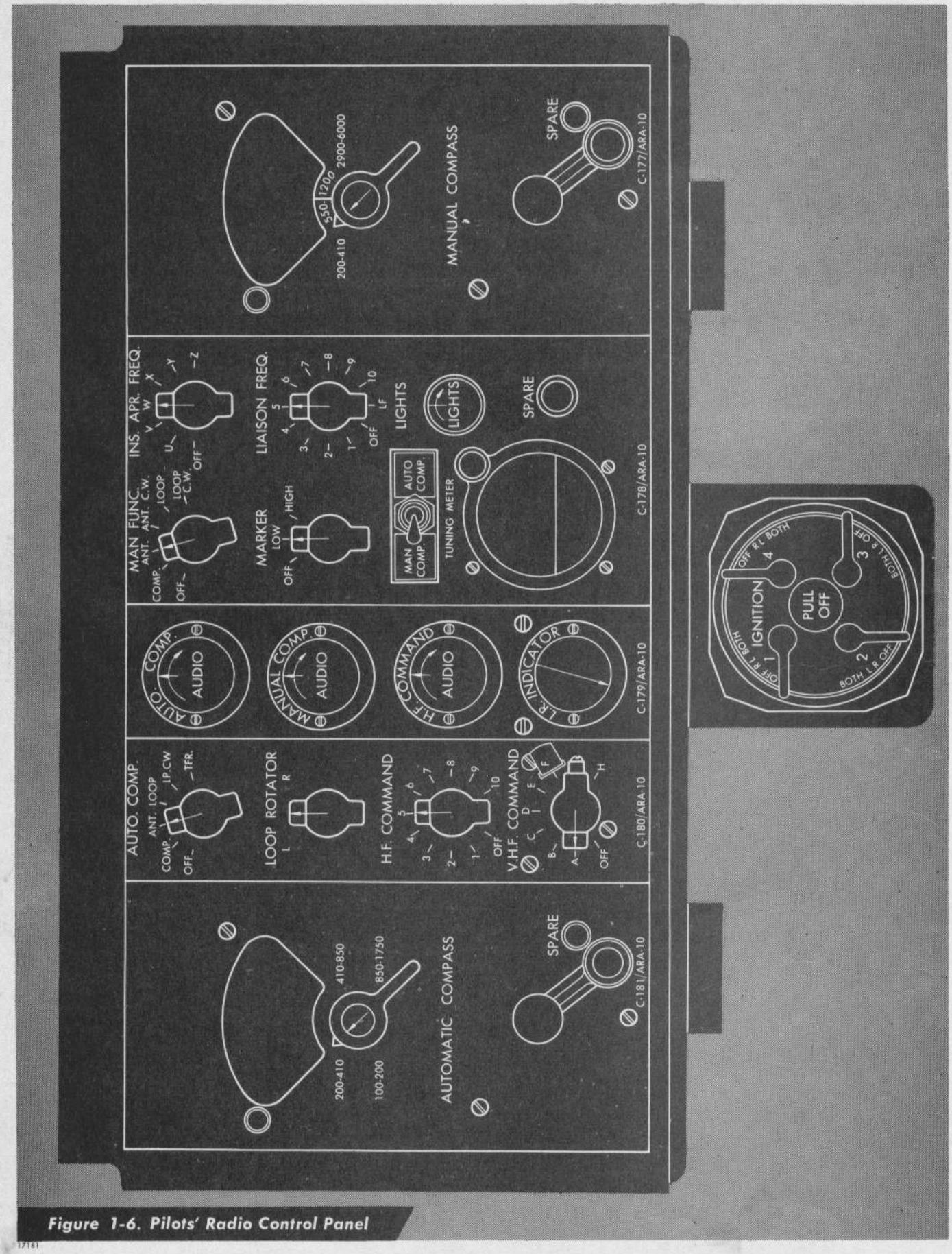

Figure 1-6. Pilots' Radio Control Panel

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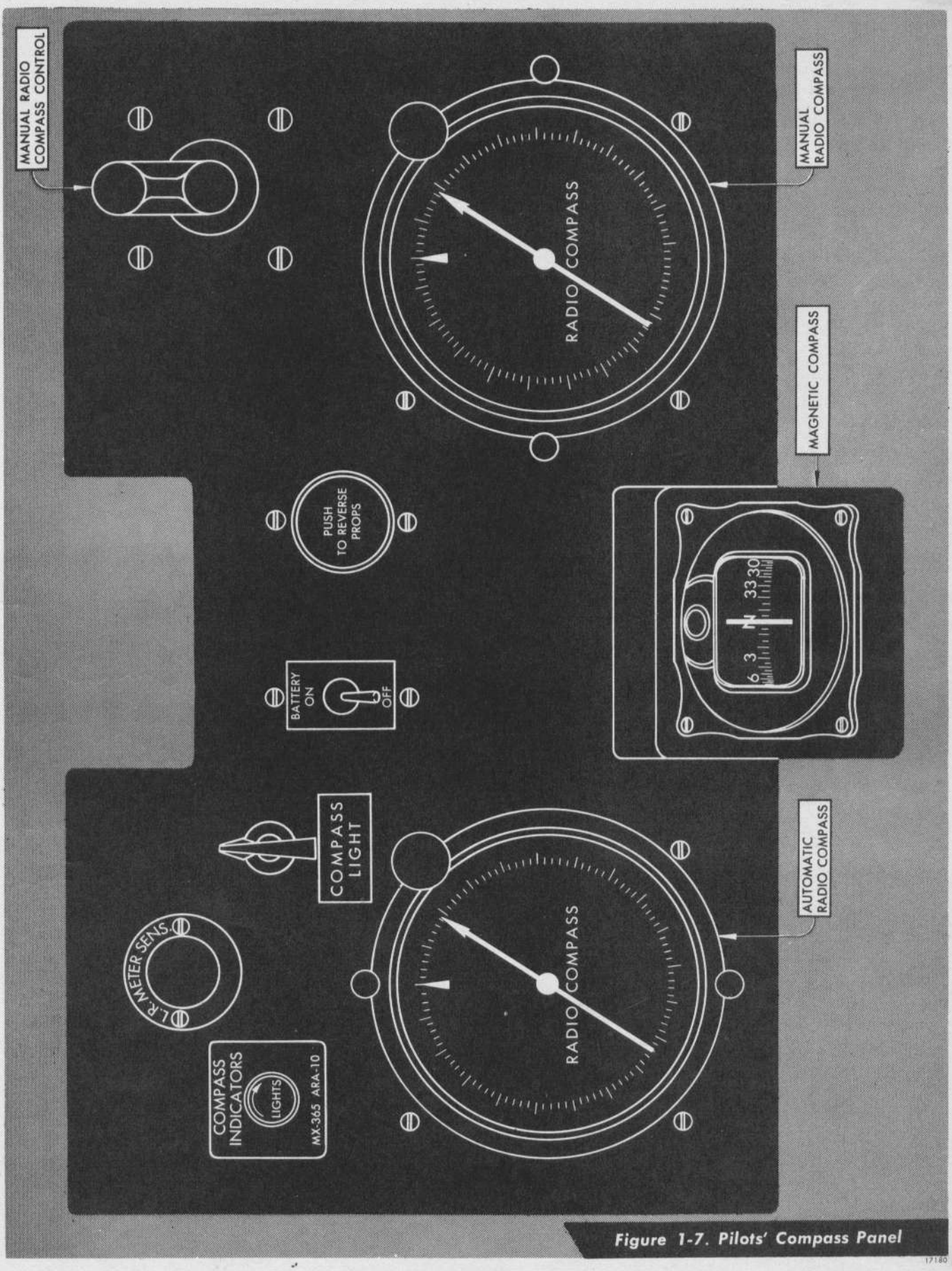

Figure 1-7. Pilots' Compass Panel

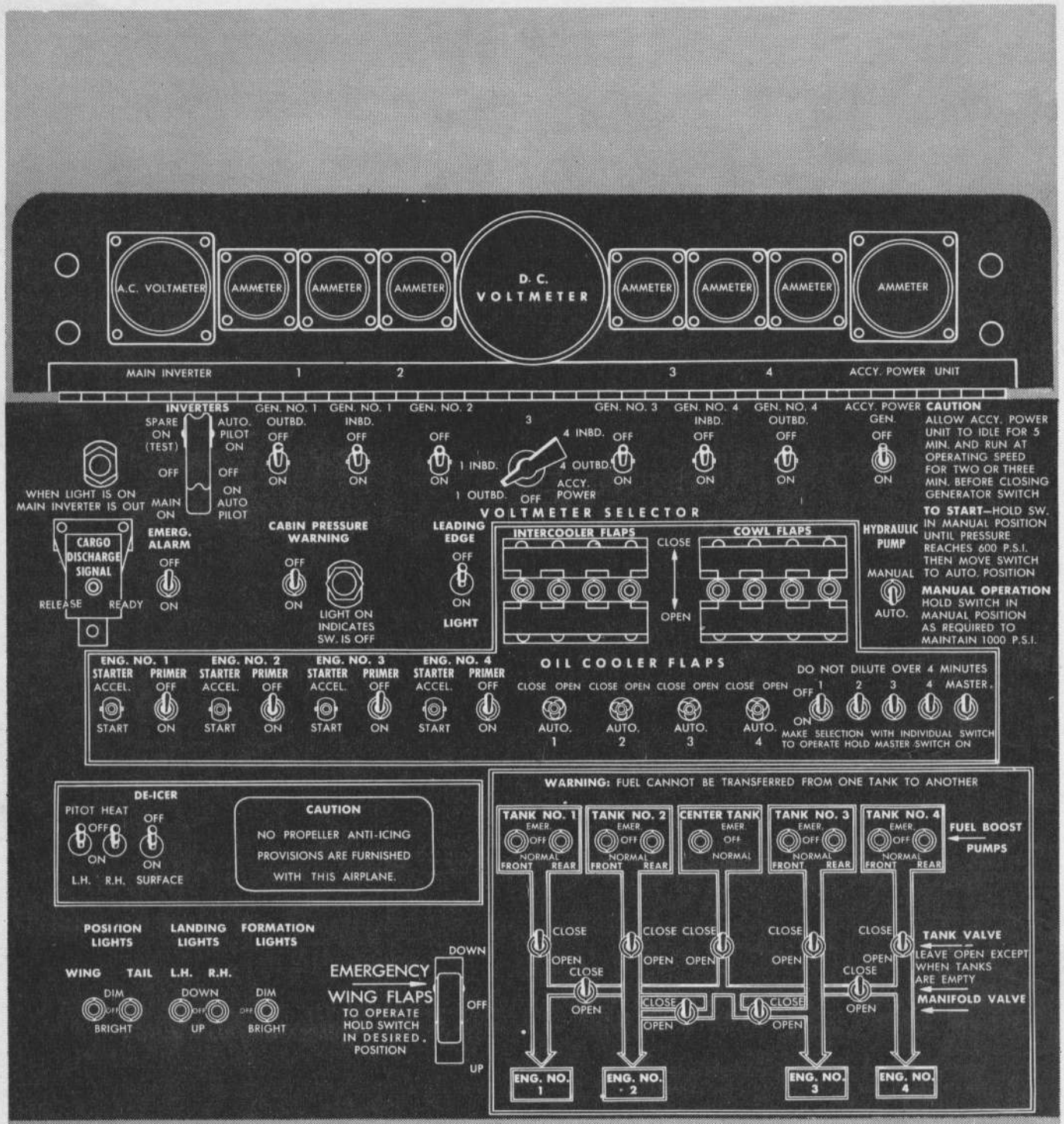

Figure 1-8. Pilots' and Engineer's Overhead Switch Panel

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1-3. FLIGHT CONTROLS.

1-4. SURFACE CONTROLS. Except for the elevator trim tabs, all of the control systems are conventional. The right elevator trim tab is operated by the elevator trim-tab control. The left elevator trim tab is operated only by the wing flaps. As the wing flaps are extended the left elevator trim tab is raised, which automatically trims the airplane. When the flaps are extended 45 degrees the tab is raised 4 1/2 degrees maximum.

1-5. SURFACE CONTROL AND THROTTLE LOCK. The control-lock lever on the engine control stand locks the ailerons and rudder in neutral, the elevators down, and the inboard throttles closed. The surface controls and throttles are unlocked when the lock lever is in the full forward position and locked when the lever is in the full rear position, *figure 1-5.*

1-6. TRIM TABS. The trim tabs are operated by control wheels on the engine control stand accessible to both pilots. Indicators show the respective trim-tab positions. The elevator trim-tab indicator shows the position of the right elevator trim tab only.

1-7. AUTOMATIC PILOT.

1-8. The Pioneer automatic pilot, type F-1, is installed in this airplane. The F-1 automatic pilot maintains the airplane on any magnetic heading with complete stability in pitch and bank. If the airplane is displaced from its heading, there is no oscillation or overswing when resuming the heading.

1-9. The automatic pilot is controlled by the turn-and-pitch-control knob and is engaged or disengaged from the control surfaces of the airplane by a "PUSH-PULL" clutch switch. Both of these controls are located on the engine control stand.

1-10. The vertical gyro control, the rate gyro control, and the master direction indicator are located on the pilot's instrument panel. These flight attitude indicators serve a dual purpose as both manual flight instruments and autopilot flight instruments.

1-11. The system is electrically operated and is energized by the autopilot inverter switch, located on the pilots' and engineer's overhead switch panel and an "OFF-ON" switch on the engine control stand.

1-12. ENGINE CONTROLS.

1-13. THROTTLE CONTROLS. The four throttle levers on the engine control stand are conventional. The inboard throttles are locked in the closed position when the surface control lock is engaged.

1-14. MIXTURE CONTROLS. The four mixture control levers are conventional.

1-15. SUPERCHARGER CONTROLS.. A turbo-boost selector knob is on the engine control stand, *figure 1-5.* The knob is marked with a scale from "0" to "10," and has a dial stop latch at "8." Clockwise rotation of the selector knob increases the resultant manifold pressure. Four calibrating knobs grouped around the turbo selector knob permit the synchronization of the manifold pressures for all four engines.

1-16. COWL FLAP CONTROLS. Four "OPEN-OFF-CLOSE" switches, on the pilots' and engineer's overhead switch panel, control the cowl flaps.

1-17. INTERCOOLER FLAP CONTROLS. Four "OPEN-OFF-CLOSE" switches, adjacent to cowl-flap switches, control the intercooler flaps.

1-18. MANIFOLD PRESSURE PURGE VALVE CONTROLS. The spring-loaded buttons on the pilots' instrument panel clear the manifold pressure instrument lines of liquids and vapors.

1-19. PROPELLER CONTROLS.

1-20. SELECTOR SWITCHES. There are four propeller switches on the engine control stand. These four-position "AUTO—INC RPM—FIXED PITCH—DEC RPM" switches are spring-loaded in the "INC RPM" and "DEC RPM" positions. A light near each switch indicates automatic propeller operation when the switch is in the "AUTO" position.

1-21. MASTER SYNCHRONIZER. The synchronizer control knob on the engine control stand operates all four propellers simultaneously, when the individual selector switches are in "AUTO" position. An "OFF-ON" switch near this control knob energizes the synchronizer for operation.

1-22. REVERSE PITCH SWITCHES. Two pairs of gang reverse pitch switches are on the engine control stand. One pair controls the inboard propellers and the other pair controls the outboard propellers. These switches have two positions: "REVERSE" and "NORMAL." A reverse actuator switch on the pilots' compass panel, *figure 1-7,* is pushed to complete the action of propeller reversal.

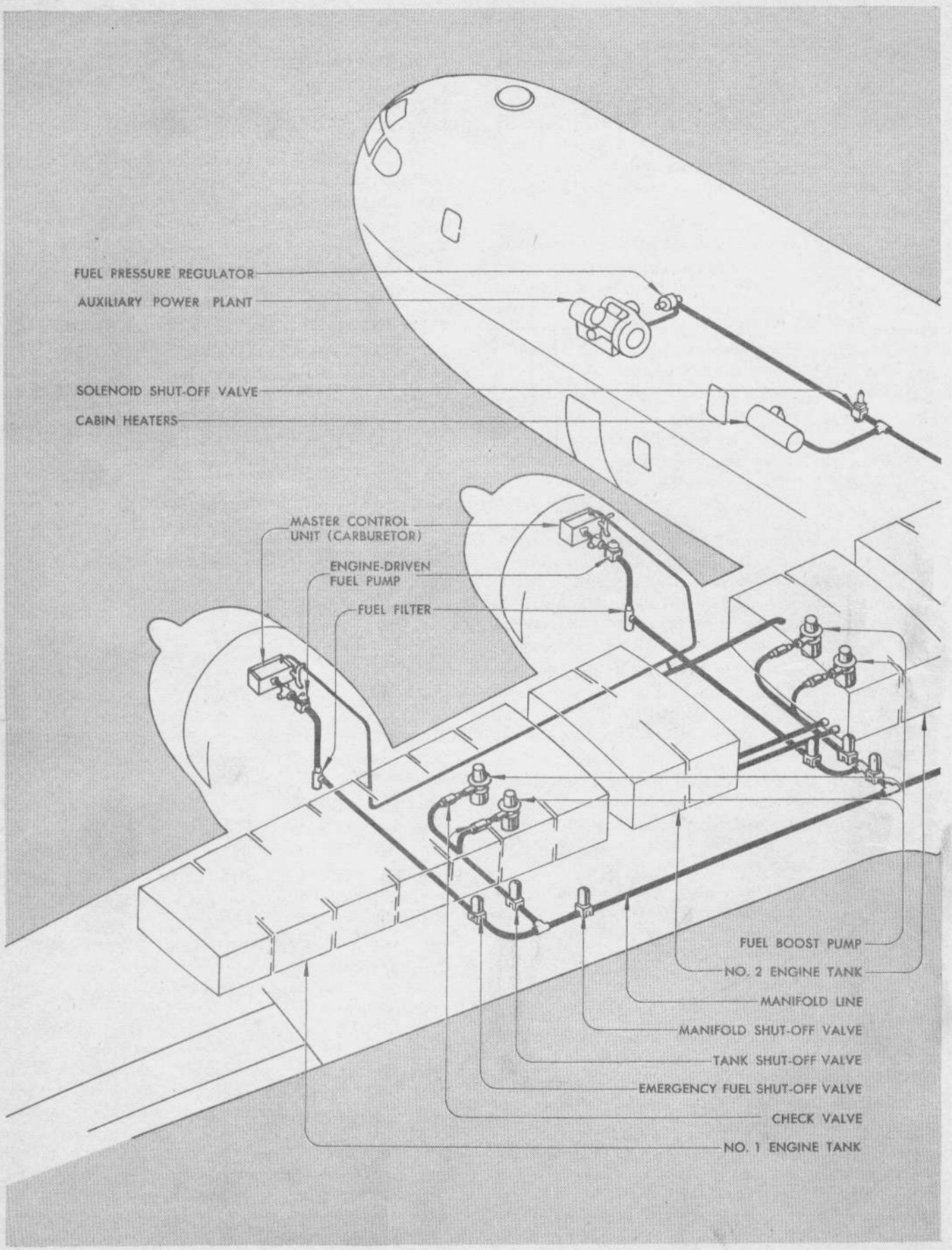
1-23. FEATHERING SWITCHES. Four individual two-position, "FEATHER-NORMAL," switches are on top of the pilots' instrument panel.

1-24. PROPELLER CIRCUIT BREAKERS. Four push-to-reset circuit-breaker switches are on the pilots' left circuit-breaker panel, *figure 1-12.*

1-25. MASTER SYNCHRONIZER TACHOMETER. This tachometer indicates the RPM selected by the master-synchronizer knob and is located on the pilots' instrument panel.

1-26. FUEL SYSTEM.

1-27. The airplane has a manifold fuel system arranged as shown in *figure 1-9.* Each outboard engine fuel tank consists of seven interconnected cells. Each inboard engine fuel tank consists of four interconnected cells. The center fuselage fuel tank in the center wing section consists of three interconnected cells. The total fuel capacity is 7055 U. S. gallons. The following figures show the amount of fuel that is unavailable. (These figures are estimated and are subject to change):


FUEL PRESSURE REGULATOR
AUXILIARY POWER PLANT
SOLENOID SHUT-OFF VALVE
CABIN HEATERS
MASTER CONTROL UNIT (CARBURETOR)
ENGINE-DRIVEN FUEL PUMP
FUEL FILTER
FUEL BOOST PUMP
NO. 2 ENGINE TANK
MANIFOLD LINE
MANIFOLD SHUT-OFF VALVE
TANK SHUT-OFF VALVE
EMERGENCY FUEL SHUT-OFF VALVE
CHECK VALVE
NO. 1 ENGINE TANK

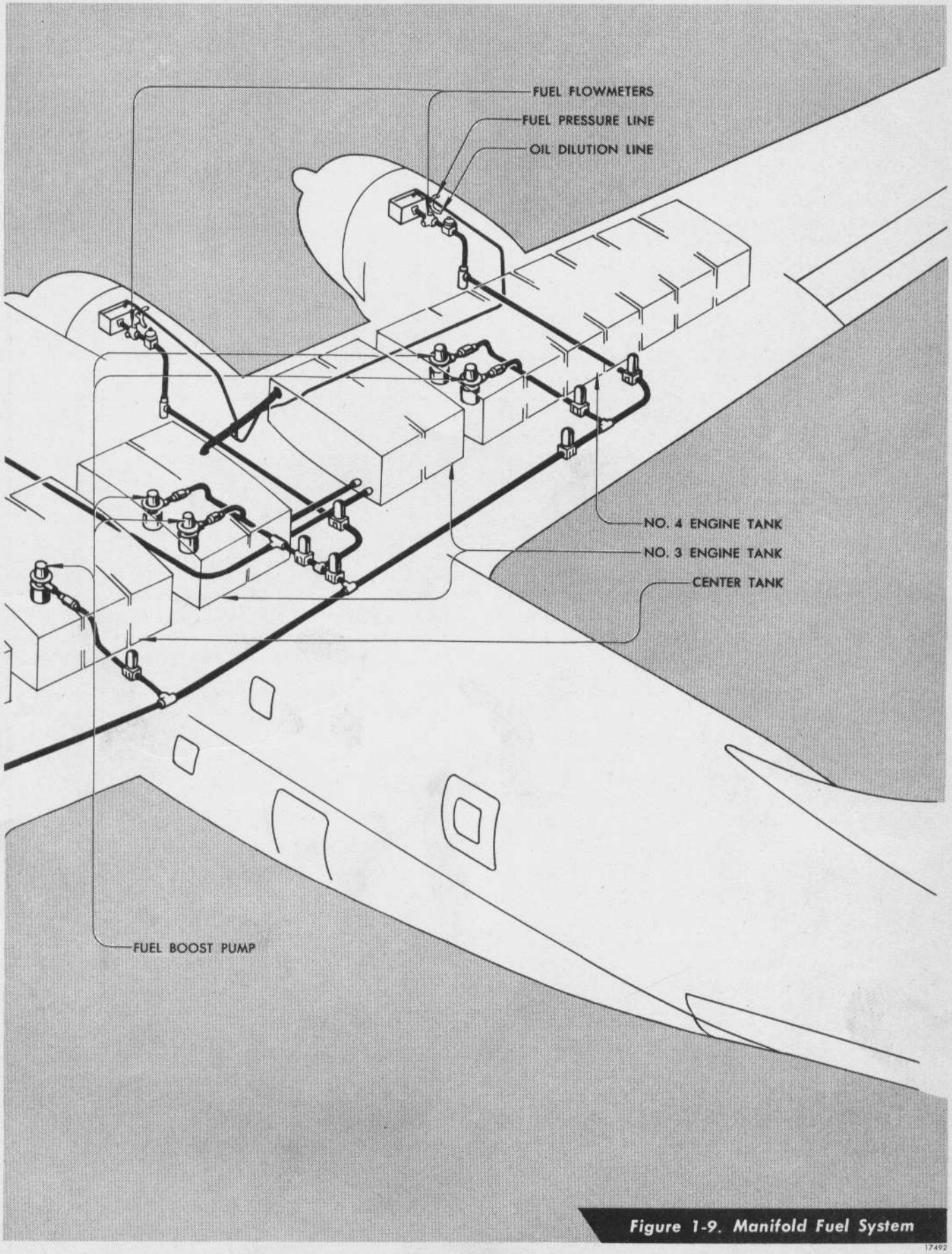


Figure 1-9. Manifold Fuel System

Airplane Attitude	*Outboard Tanks*	*Inboard Tanks*	*Center Tanks*
10-degree Climb	7 gallons	9 gallons	8 gallons
15-degree Glide	7 gallons	9 gallons	8 gallons
Undrainable in Taxi Position	4 gallons	3 gallons	2 gallons
	18 gallons	21 gallons	18 gallons

This allows a total of 6998 U. S. gallons as usable fuel. The accessory power plant and cabin heaters receive their fuel directly from the No. 3 engine fuel tank.

1-28. FUEL SELECTOR CONTROLS. Three electric motor-driven shutoff valves control the fuel flow from each main fuel tank. One valve (the TANK SHUTOFF VALVE) isolates the tank, the second valve (the MANIFOLD SHUTOFF VALVE) isolates the manifold line, and the third valve (the EMERGENCY FUEL SHUTOFF VALVE) isolates the engine. The center fuselage tank connects to the manifold line through a tank shutoff valve. The "OPEN-CLOSE" switches for the tank shutoff valve and manifold shutoff valves are on the pilots' and engineer's overhead switch panel. The switches for the emergency fuel shutoff valves are on the copilot's auxiliary panel.

1-29. FUEL BOOSTER PUMP CONTROLS. Each main fuel tank has two submerged fuel booster pumps placed so that a minimum amount of fuel is trapped during extreme attitudes of flight. The two booster pumps can be operated either individually or together. The center fuselage tank has only one fuel booster pump. Each booster pump is controlled by an "EMERGENCY-OFF-NORMAL" switch located on the pilots' and engineer's overhead switch panel. The fuel pressure with the booster pump switch on "NORMAL" should indicate approximately 10 PSI, and when placed on "EMERGENCY" the fuel pressure should be between 17 and 25 PSI. This check is made when the engines are not operating.

1-30. FUEL SYSTEM PRIMER CONTROLS. The four fuel primer "OFF-ON" switches are on the pilots' and engineer's overhead switch panel.

1-31. FUEL SYSTEM INSTRUMENTS. Individual fuel quantity indicators, on the pilots' instrument panel, show the quantity of fuel for each engine tank and the center tank. Dual flowmeters on the pilots' instrument panel indicate the fuel rate of flow in pounds per hour for each engine. The dual fuel pressure indicators also are on the pilots' instrument panel.

1-32. OIL SYSTEM.

1-33. Each engine has an independent oil system. No provision is made for oil transfer from one engine tank to another. The normal capacity of each engine oil tank is approximately 80 U. S. gallons.

1-34. OIL SYSTEM INSTRUMENTS. All oil system instruments are on the pilots' instrument panel. Dual indicators show the quantity of oil in each engine tank. Dual indicators show the temperature of the oil for each engine as measured by a temperature bulb in the oil line just as it leaves the tank. Dual indicators show the oil pressures for each engine at both the rear and front oil pumps.

1-35. OIL COOLER CONTROLS. A flap in the bottom of each nacelle controls the amount of cooling air through the oil cooler. Each flap is controlled by an "OFF-AUTO-OPEN-CLOSED" switch on the pilots' and engineer's overhead switch panel. See *figure 1-8.* With the switches in "AUTO" the position of the oil-cooler flaps are automatically controlled to maintain the oil temperatures within the normal operating range of 50° to 85°C. If extreme operating conditions or failure of the automatic circuit causes abnormal oil temperatures the oil-cooler flaps can be positioned by holding the switches in "OPEN" or "CLOSED." The switches are spring-loaded in these two positions. It requires approximately 15 seconds for the oil-cooler flaps to reach the full open or closed position when the switches are held in the manual position.

1-36. OIL SHUTOFF CONTROLS. The oil shutoff valve for each engine is in the oil line between the oil tank and the engine. Each shutoff valve is controlled by an "OPEN-CLOSE" switch on the copilot's auxiliary panel, *figure 1-14.* The oil shutoff valve for any engine will close only when the emergency fuel shutoff valve for that engine is closed and the oil shutoff valve will open when its switch is placed in "OPEN" or when the emergency fuel shutoff valve is opened.

1-37. OIL DILUTION CONTROLS. Four individual "OFF-ON" switches and one master switch on the pilots' and engineer's overhead switch panel control the oil dilution valves. The oil for all four engines can be diluted simultaneously.

1-38. ELECTRICAL SYSTEM.

1-39. GENERATORS AND BATTERY. Continuous 28-volt direct-current power is produced by six engine-driven generators (one on each inboard engine and two on each outboard engine), an auxiliary power-plant generator , and a battery located in the lower forward cargo compartment.

1-40. INVERTERS. The alternating current used by remote indicating instruments, turbosupercharger controls, automatic pilot, fluorescent lights, and some radio equipment is provided by three inverters in the lower nose compartment. One of these inverters supplies power to the automatic pilot exclusively. Of the two remaining inverters one is used as the main inverter and the other is in a standby status or spare. Under normal conditions, the spare inverter can supply power to the fluorescent lights while the main inverter operates all other alternating-current equipment. In the event of main inverter failure the spare inverter will

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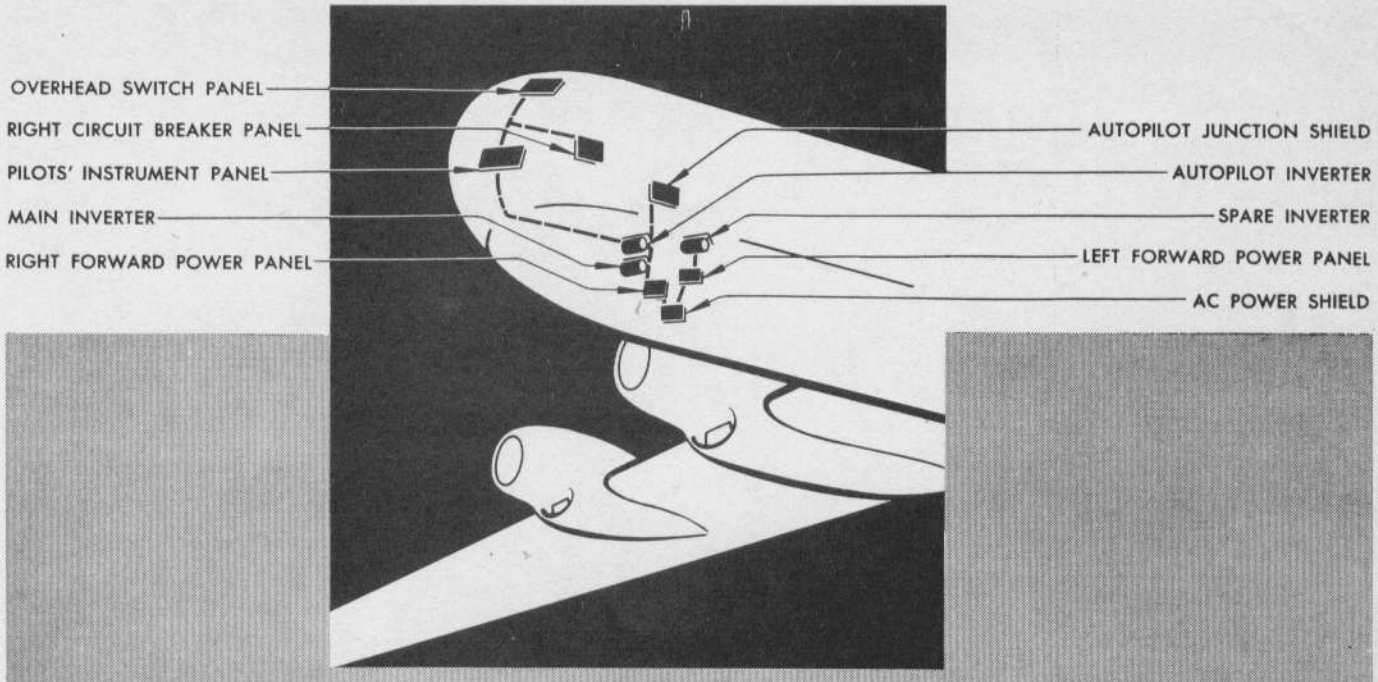

Figure 1-10. Alternating Current Power Distribution Panels

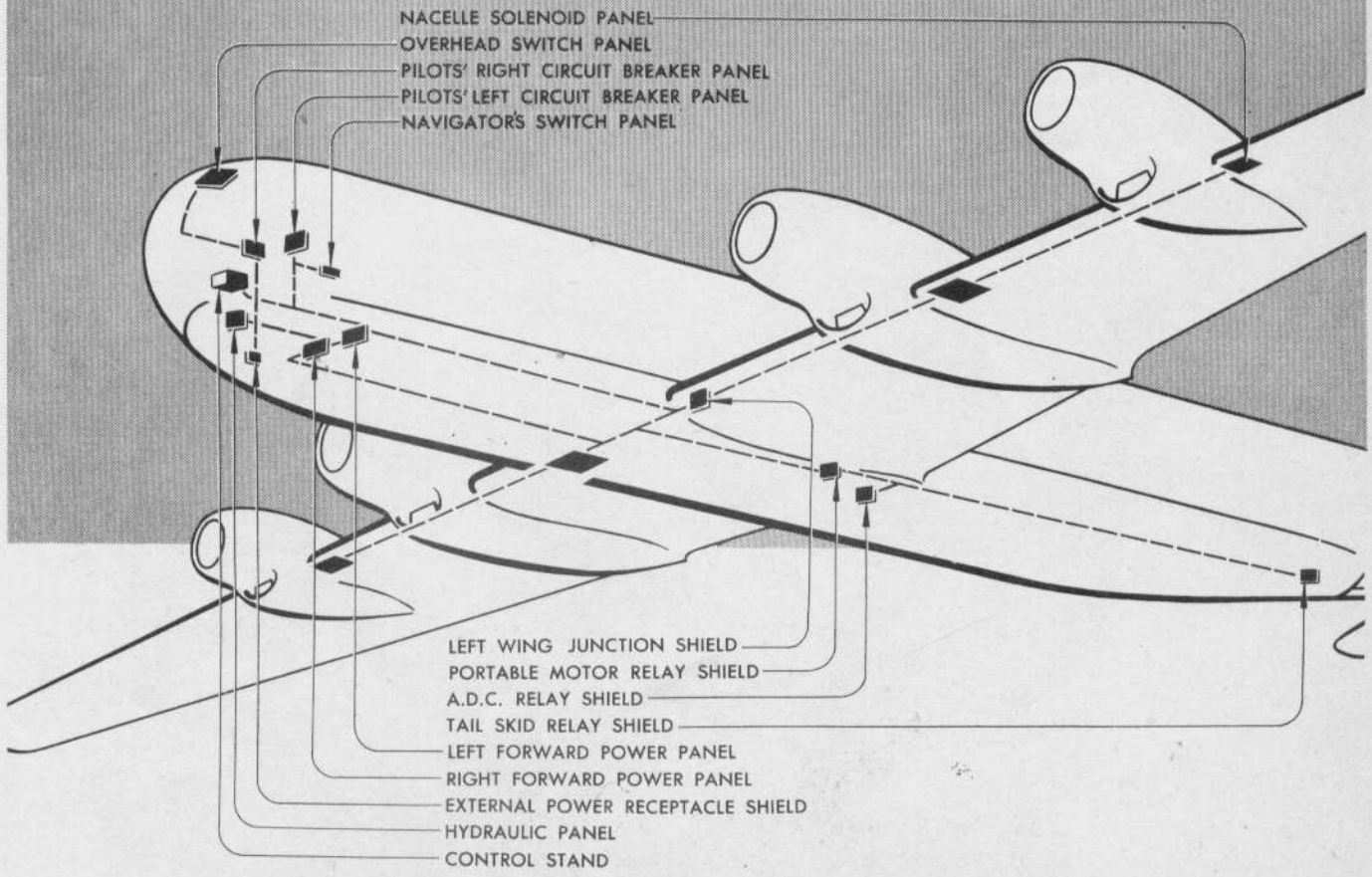

Figure 1-11. Direct Current Power Distribution Panels

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Figure 1-12. Left Circuit Breaker Panel

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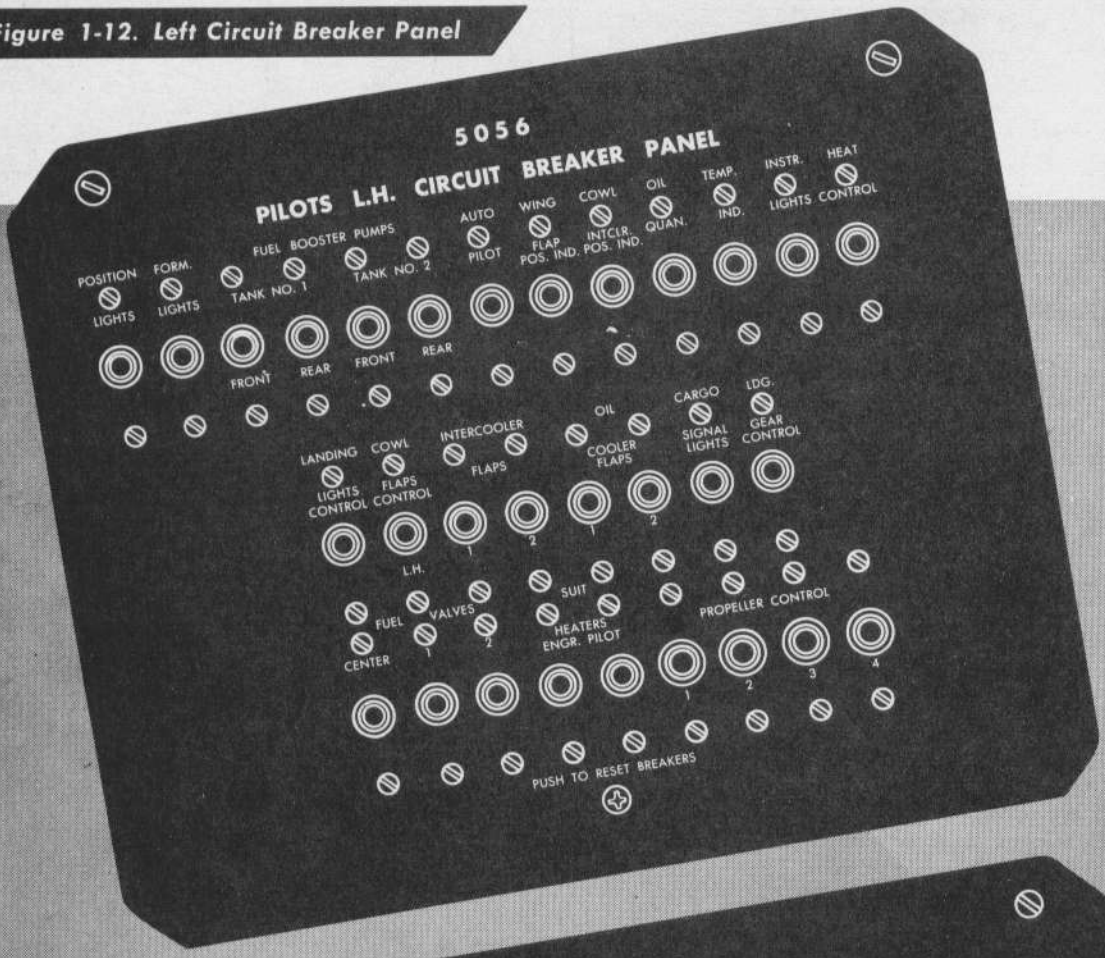

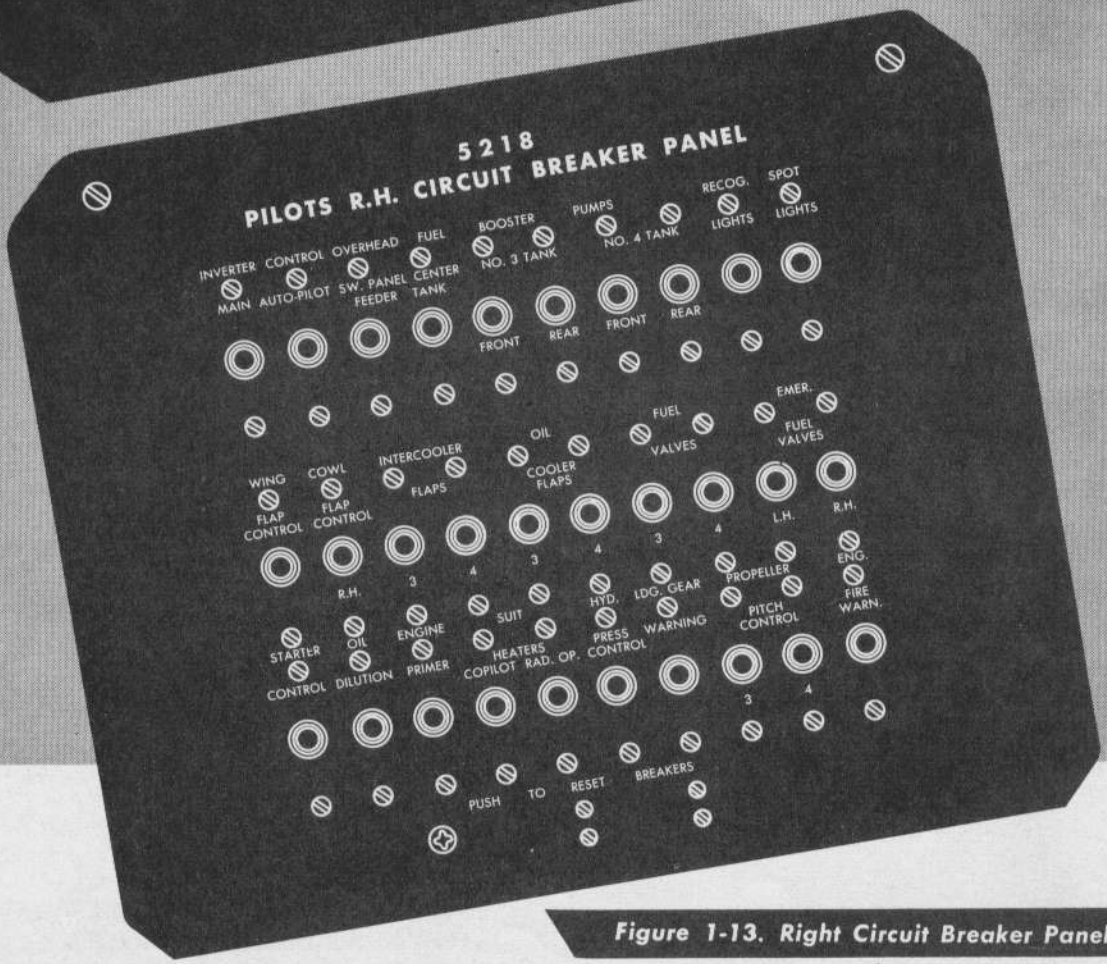

Figure 1-13. Right Circuit Breaker Panel

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automatically change over and supply power for all the alternating-current equipment except the fluorescent lights, which will be inoperative.

1-41. EXTERNAL POWER RECEPTACLE. To provide a connection for an external power source during ground operations, a receptacle is located on the right side of the nose landing gear well.

1-42. GENERATOR SWITCHES. Seven individual "OFF-ON" switches connect the generators to the direct-current distribution system. These switches, six for the engine-driven generators and one for the accessory-power plant-generator, are on the pilots' and engineer's overhead switch panel, *figure 1-8.*

1-43. BATTERY SWITCH. The "OFF-ON" switch is on the pilots' compass panel, *figure 1-7.*

1-44. INVERTER SWITCH. The three inverters are controlled manually by the three-position, "MAIN ON-OFF-SPARE ON," switch on the pilots' and engineer's overhead switch panel. When the switch is placed in either "ON" position the automatic-pilot inverter is also turned "ON."

1-45. CIRCUIT BREAKERS. Push-to-reset and switch-type circuit breakers protect the individual electrical circuits from overload. The circuit breakers are located throughout the airplane and are accessible in flight except those in the nacelle solenoid panels.

1-46. VOLTMETERS. A direct-current voltmeter and a rotary selector switch permit the voltage reading for any generator. An alternating-current voltmeter is also provided. The voltmeters and selector switch are on the overhead switch panel, *figure 1-8.*

1-47. AMMETERS. Seven direct-current ammeters, six for the engine-driven generators and one for the accessory power plant, are on the pilots' and engineer's overhead switch panel.

1-48. IGNITION SWITCHES. One multiple ignition switch is located forward of the pilots' and engineer's overhead switch panel between the pilots' radio control panel and the pilots' compass panel. This switch consists of a master pull switch and four separate engine ignition switches.

1-49. STARTER SWITCHES. Four, three-position "ACCELERATE-OFF-START" spring-loaded, starter switches are on the pilots' and engineer's overhead switch panel, *figure 1-8.*

1-50. PITOT TUBE SWITCHES. Two "OFF-ON" switches on the pilots' and engineer's overhead switch panel control the heater elements in the right and left pitot tubes respectively.

1-51. SURFACE DEICER SWITCH. An "OFF-ON" switch on the pilots' and engineer's overhead switch panel controls the operation of the deicer boots.

1-52. ELECTRICAL RECEPTACLES. These are located throughout the airplane.

1-53. LIGHTS. The exterior lights consist of the following: Wing and tail position lights, formation lights, wing leading-edge lights, and landing lights. The wing leading-edge lights are located in each outboard nacelle and are used to check wing-ice formation. The retractible landing lights on the under side of each wing can be stopped in any desired position. These lights automatically turn on when extended past the 10-degree position from fully retracted.

1-54. The interior lights consist of the fluorescent lights and dome lights for general illumination, instrument panel lights, spot lights (for each of the crew stations, accessory power plant and astrodome), work table lights (for the radio operators and navigator) and a compass light.

1-55. LIGHT SWITCHES. All of the exterior lights are controlled by toggle switches on the pilots' and engineer's overhead switch panel.

1-56. The interior lights are controlled by either toggle or rheostat switches located in the vicinity of the light or lights they control. The main cargo compartment fluorescent light circuit is energized by a master switch on the forward bulkhead and switched on or off by toggle switches to the left of each pair of fluorescent lights. The dome lights in the main cargo compartment can be controlled by "OFF-ON" switches, one in each end of the compartment.

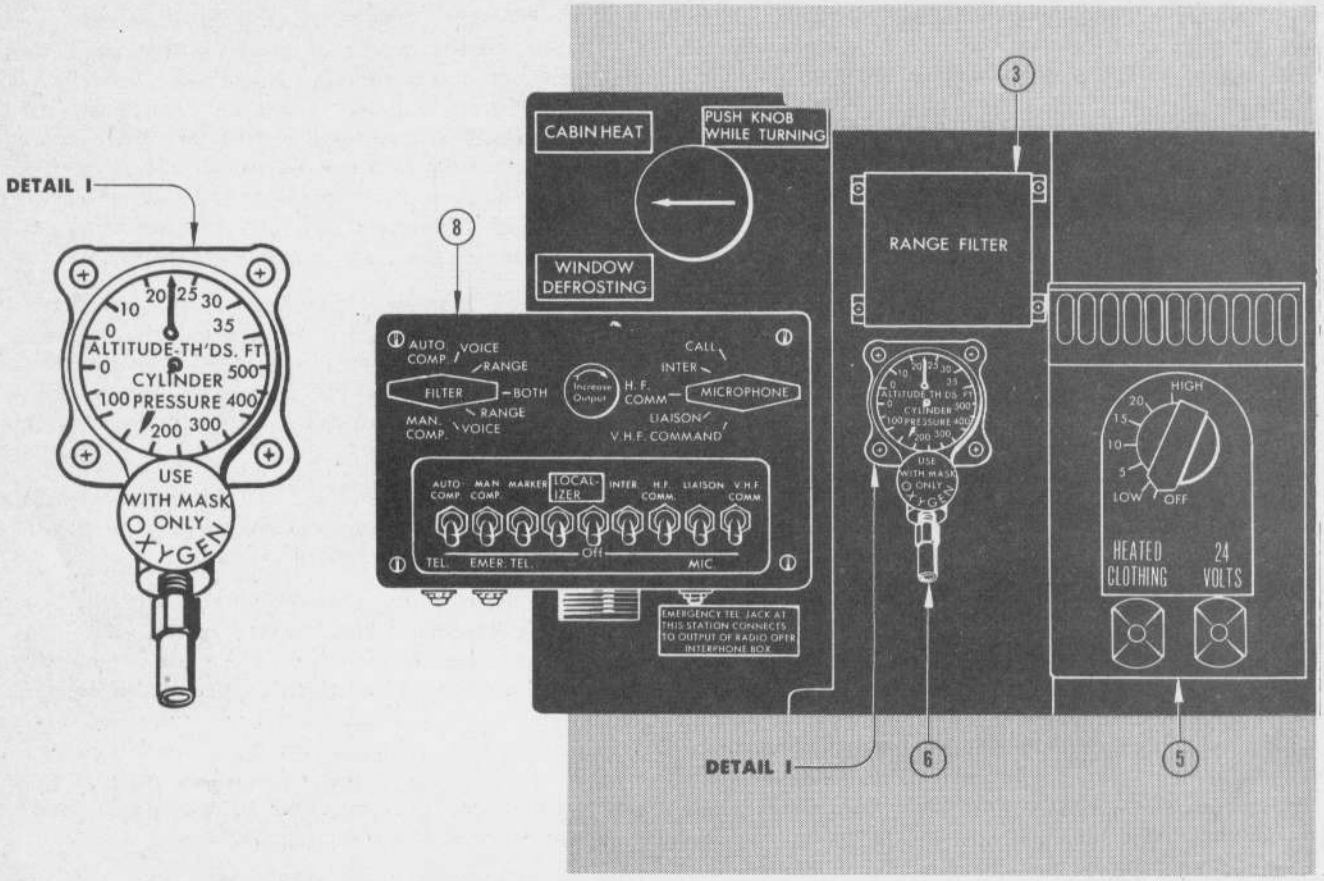
1-57. WARNING SIGNALS. Warning switches incorporated in the electrical system operate a warning horn when any of the following conditions exist: (1) On takeoff, when the throttles are more than three-fourths open, and the wing flaps are extended less than 20 degrees or more than 30 degrees, or the cowl flaps are open in excess of 15 degrees. (2) On landing, when the throttles are less than one-third open and the landing gear is in any position other than down and locked. (3) When the cabin pressure is reduced below the regulator setting.

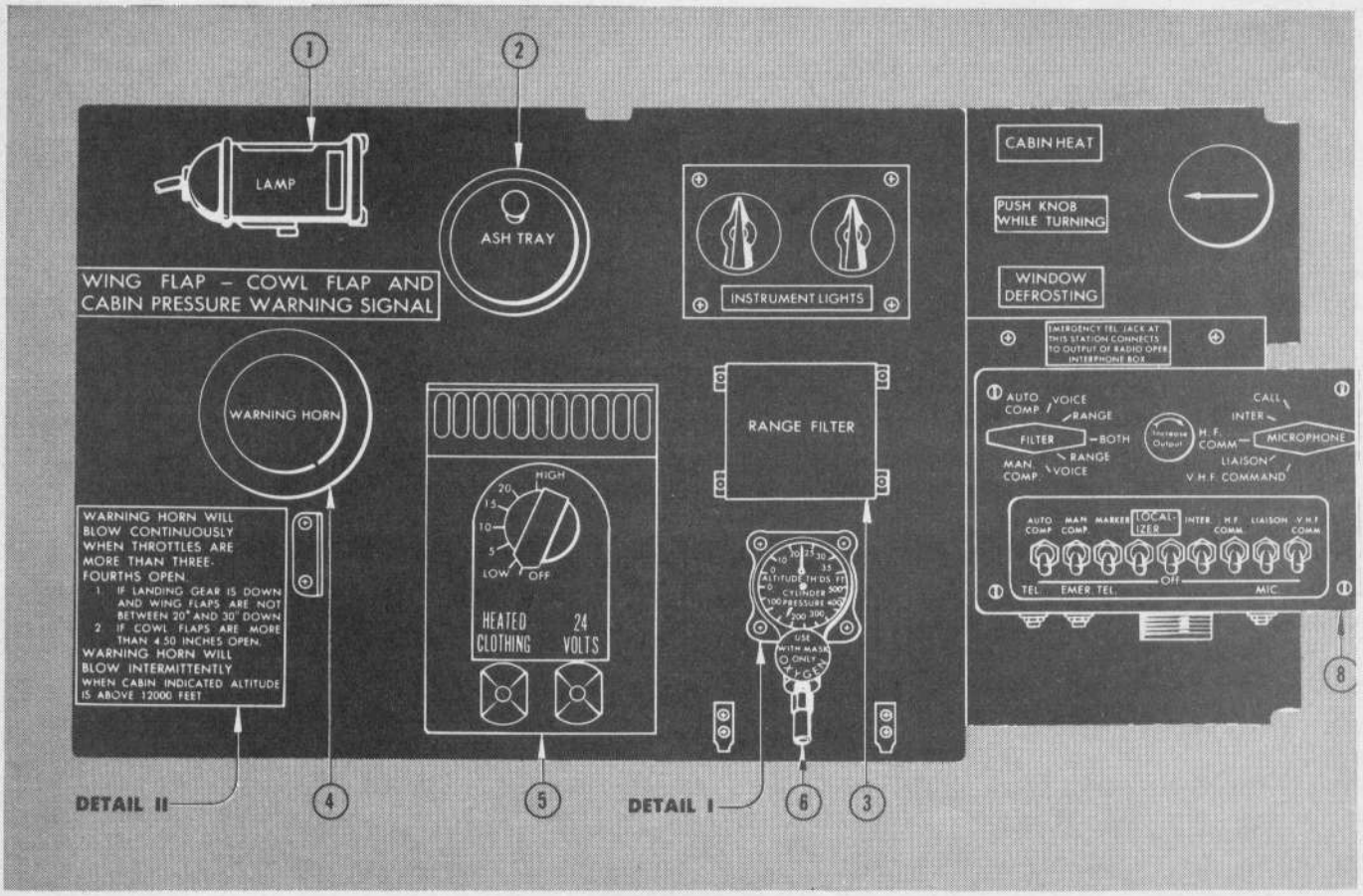
1-58. WARNING LIGHTS. Warning lights are installed on the pilots' instrument panel and overhead switch panel to indicate hydraulic pressure failure, doors open, inverter failure, cabin pressure warning switch off, and landing gear position.

1-59. WING FLAP CONTROLS.

1-60. NORMAL. The wing flaps are electrically operated by motor-driven actuating screws. A three-position, "DOWN-OFF-UP," switch, on the engine control stand, controls the wing-flap motor for normal operation. The wing-flap position indicator is on the pilots' instrument panel.

1-61. EMERGENCY. An auxiliary motor is mounted above and connected to the wing-flap motor. This motor is used when the normal wing-flap system fails. The auxiliary motor is controlled by a spring-loaded "DOWN-OFF-UP" switch on the pilots' and engineer's overhead switch panel.


DETAIL I
ALTITUDE-TH'DS. FT
CYLINDER PRESSURE
USE WITH MASK ONLY OXYGEN
CABIN HEAT
PUSH KNOB WHILE TURNING
WINDOW DEFROSTING
RANGE FILTER
AUTO COMP.
VOICE
RANGE
FILTER
BOTH
MAN. COMP.
CALL
INTER
H. F. COMM
MICROPHONE
LIAISON
V.H.F. COMMAND
AUTO COMP.
MAN COMP.
MARKER
LOCALIZER
INTER
H.F. COMM.
LIAISON
V.H.F. COMM.
TEL.
EMER. TEL.
Off
MIC.
EMERGENCY TEL JACK AT THIS STATION CONNECTS TO OUTPUT OF RADIO OPER. INTERPHONE BOX
HIGH
LOW
OFF
HEATED CLOTHING
24 VOLTS
8
3
6
5
DETAIL I


1
2
LAMP
ASH TRAY
WING FLAP – COWL FLAP AND CABIN PRESSURE WARNING SIGNAL
INSTRUMENT LIGHTS
CABIN HEAT
PUSH KNOB WHILE TURNING
WINDOW DEFROSTING
WARNING HORN
WARNING HORN WILL BLOW CONTINUOUSLY WHEN THROTTLES ARE MORE THAN THREE-FOURTHS OPEN.
1. IF LANDING GEAR IS DOWN AND WING FLAPS ARE NOT BETWEEN 20° AND 30° DOWN
2. IF COWL FLAPS ARE MORE THAN 4.50 INCHES OPEN.
WARNING HORN WILL BLOW INTERMITTENTLY WHEN CABIN INDICATED ALTITUDE IS ABOVE 12000 FEET
RANGE FILTER
HEATED CLOTHING
24 VOLTS
DETAIL II
DETAIL I
4
5
6
3
8

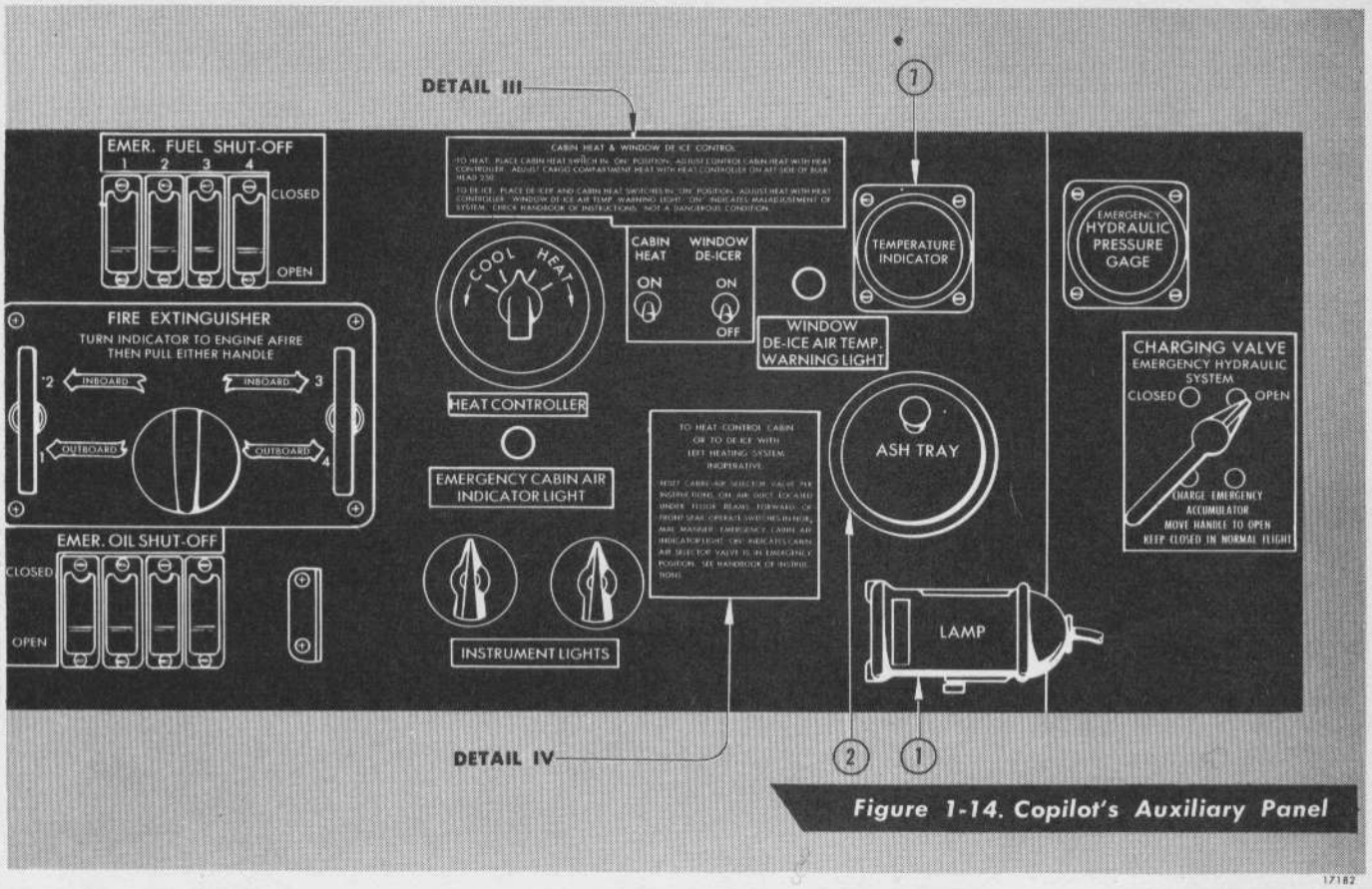


Figure 1-14. Copilot's Auxiliary Panel

17182

DETAIL III

CABIN HEAT & WINDOW DE-ICE CONTROL

TO HEAT: PLACE CABIN HEAT SWITCH IN "ON" POSITION. ADJUST CONTROL CABIN HEAT WITH HEAT CONTROLLER. ADJUST CARGO COMPARTMENT HEAT WITH HEAT CONTROLLER ON AFT SIDE OF BULKHEAD 230.

TO DE-ICE: PLACE DE-ICER AND CABIN HEAT SWITCHES IN "ON" POSITION. ADJUST HEAT WITH HEAT CONTROLLER. WINDOW DE-ICE AIR TEMP. WARNING LIGHT "ON" INDICATES MALADJUSTMENT OF SYSTEM. CHECK HANDBOOK OF INSTRUCTIONS. NOT A DANGEROUS CONDITION.

DETAIL II

WARNING HORN WILL BLOW CONTINUOUSLY WHEN THROTTLES ARE MORE THAN THREE-FOURTHS OPEN.

1. IF LANDING GEAR IS DOWN AND WING FLAPS ARE NOT BETWEEN 20° AND 30° DOWN
2. IF COWL FLAPS ARE MORE THAN 4.50 INCHES OPEN.

WARNING HORN WILL BLOW INTERMITTENTLY WHEN CABIN INDICATED ALTITUDE IS ABOVE 12000 FEET.

1. LAMP
2. ASH TRAY
3. RANGE FILTER
4. WARNING HORN
5. HEATER RHEOSTAT
6. OXYGEN REGULATOR
7. TEMPERATURE INDICATOR
8. INTERPHONE CONTROL BOX

DETAIL IV

TO HEAT CONTROL CABIN OR TO DE-ICE WITH LEFT HEATING SYSTEM INOPERATIVE:

RESET CABIN AIR SELECTOR VALVE PER INSTRUCTIONS ON AIR DUCT LOCATED UNDER FLOOR BEAMS FORWARD OF FRONT SPAR. OPERATE SWITCHES IN MORMAL MANNER. EMERGENCY CABIN AIR INDICATOR LIGHT "ON" INDICATES CABIN AIR SELECTOR VALVE IS IN EMERGENCY POSITION. SEE HANDBOOK OF INSTRUCTIONS.

Figure 1-15. Pilot's Auxiliary Panel

17177

1-62. LANDING GEAR CONTROLS.

1-63. NORMAL. A three-position "DOWN-OFF-UP" switch on the engine control stand controls the electric motors that operate the landing gear.

1-64. EMERGENCY. In an emergency the landing gear is operated manually by hand cranks. The nose gear crank is located in the lower nose compartment and the main landing gear cranks are on each side of the lower rear cargo compartment. Pull handles are located near the emergency operation gear boxes to release the normal motor clutches, engage the manual system, and free the up-locks. The tail skid cannot be lowered in the emergency operation. The auxiliary motor mounted above the wing-flap motor can be removed and used for emergency operation. A three-way switch on this motor controls its operation when moved from the wing-flap motor mounting.

1-65. HYDRAULIC SYSTEM.

1-66. There are two separate hydraulic systems, one for the brakes and one for the cargo doors. The brake system is divided into the main and emergency hydraulic systems.

1-67. MAIN HYDRAULIC SYSTEM CONTROL. A two-position, "AUTO-MANUAL," switch operates the electrically-driven pump which provides pressure for the system. This switch is spring-loaded in the "MANUAL" position and is located on the pilots' and engineer's overhead switch panel. A hand pump, on the floor to the right of the copilot's seat, is used when the motor-driven pump fails.

1-68. EMERGENCY HYDRAULIC SYSTEM CONTROL. The emergency system is charged when the charging handle on the copilot's auxiliary panel, *figure 1-14,* is placed on "OPEN." The normal position is "CLOSED."

1-69. HYDRAULIC SYSTEM INDICATORS. The main hydraulic system pressure indicator, and the main and emergency system pressure warning lights are on the pilots' instrument panel. The emergency system pressure indicator is on the copilot's auxiliary panel near the emergency charging handle. The main and emergency system normal operating pressures are 1025 to 1225 PSI.

1-70. CARGO DOOR SYSTEM CONTROL. This separate hydraulic system is furnished pressure by its own electrical pump controlled by a three-position, "CLOSE-OFF-OPEN" cargo door handle on the left rear side of the main cargo compartment. This handle is connected both electrically and mechanically to the power unit. In the event of electric pump failure, a hand pump is provided, near the cargo door handle. The normal operating pressure for the cargo door hydraulic system is 850 PSI.

1-71. BRAKE CONTROLS.

1-72. NORMAL. Conventional toe brakes are on the pilots' rudder pedals. A parking brake knob is on the left side of the engine control stand, *figure 1-5.*

1-73. EMERGENCY. Two pairs of emergency brake handles, one pair for each pilot, are located overhead.

1-74. VACUUM SYSTEM.

1-75. The vacuum system furnishes suction and pressure for the deicer boots and the vacuum-operated flight instruments. These instruments, on the copilot's side of the pilots' instrument panel, are: the bank-and-turn indicator, the directional gyro, gyro horizon, and suction indicator. Two vacuum pumps, one on each inboard engine, supply the system.

1-76. VACUUM SELECTOR CONTROL. A lever on the engine control stand is used to select either of the two vacuum pumps.

1-77. ENGINE FIRE EXTINGUISHER SYSTEM.

1-78. Two cylinders, on the right side of the lower nose compartment, provide the source of CO_2 gas for the engine accessory section distributor ring. Two "PULL" handles and an engine selector valve are on the fire panel section of the copilot's auxiliary panel, *figure 1-14.*

1-79. AUXILIARY POWER PLANT.

1-80. An Andover auxiliary power plant, driving a direct-current generator, is in the lower forward cargo compartment. It can be used as a source of electrical power to start the engines and to ground-check electrical equipment when a source of external power is not available. The unit normally is operated during take-off and landing but if necessary can be operated in flight. It has its own oil supply, but fuel is furnished from the main fuel system.

1-81. The fuel line to the auxiliary power plant has a fuel shutoff valve which is electrically opened when the generator is motorized in starting, and is held open while the generator is operating. Normal auxiliary power-plant shutdown procedure or generator failure will close the fuel valves.

1-82. The exhaust gases and the engine cooling air are vented overboard through a single duct. The duct has a valve which must be open to operate the auxiliary power plant and must be closed to pressurize the cabin. When the valve is closed, a micro switch in the ignition circuit, actuated by the valve, prevents the auxiliary power plant from operating.

1-83. A two-position, "OFF-ON," ignition switch, a similar starter switch, and a manual control lever on the auxiliary power plant are used for electrical starting. A cord is provided for manual starting.

1-84. INSTRUMENTS.

1-85. ENGINE INSTRUMENTS. These instruments are dual indicating and are operated electrically. The manifold pressure indicators are of the direct pressure type.

1-86. GYROSCOPIC INSTRUMENTS. These instruments are electrically operated on the pilot's side of the pilots' instrument panel, *figure 1-4,* while those on the copilot's side are vacuum operated.

1-87. FLIGHT INSTRUMENTS. The altimeters, rate of climb indicators, and airspeed indicators, are operated by the pitot-static system.

1-88. POSITION INSTRUMENTS. All position indicators are electrically operated.

1-89. MISCELLANEOUS EQUIPMENT.

1-90. ALARM BELLS. Signals for "emergency bail out" may be given by the pilot, copilot or engineer. An "OFF-ON" switch, located on the overhead switch panel, will sound alarm bells located in the control cabin, main cargo compartment and each of the two lower cargo compartments.

1-91. PYROTECHNIC PISTOL. A pyrotechnic pistol is installed above the navigator's chair. The pistol may be fired while the cabin is pressurized. (See decal for instructions.) Pistol and signals are normally carried in containers located on the bulkhead behind the navigator.

1-92. SIGNAL LAMP. An inter-airplane "Aldis," or signal lamp, is mounted on the forward end of the navigator's cabinet. It may be plugged into any one of the crew's electrical suit outlet boxes, 24-volt outlet only. Lens filters are located in the forward compartment of the navigator's cabinet.

1-93. INSTRUMENT FLYING SHIELDS. Orange plastic shields are available for instrument practice. The shields fit into each windshield by means of clips. When not in use, the shields are stored in a case which is carried loose in the airplane.

1-94. NIGHT FLYING CURTAINS. With the exception of the pilot's and copilot's windshields, there are curtains on all of the windows, escape hatches and the astrodome. The pilot's and copilot's upper windshields have curtains which may be lowered as sunshades. When not in use, unfasten the lower snaps and roll the curtain to the top of the window and fasten there by means of the tab attached to the curtain. A curtain can be drawn across the control cabin, aft of the pilots' dais, for night flying.

1-95. LOAD ADJUSTER. The load adjuster is located on the miscellaneous equipment panel.

1-96. FORM NO. 1. The Form No. 1 is stored in the flight-report holder, located on the navigator's cabinet.

1-97. AIRPLANE DATA CASE. The data case is located on the miscellaneous equipment panel.

1-98. CHECK LISTS. The airplane check list is in a holder attached to the outboard arm of the copilot's seat. The cabin-pressure check list is attached to the back of the copilot's seat. The F-1 Autopilot check list is attached to the outboard arm of the pilot's seat.

1-99. G-FILE. A complete G-File is included with each airplane. Each file contains all information necessary to the operation and maintenance of the airplane and equipment installed in the airplane. Data included are: Pilot's Operating Handbook, Erection and Maintenance Manual, Radio Facilities Chart, Instrument Approach Procedure, Radio Data and Aids to Airways Flying, radio equipment T.O.'s, navigational radio equipment T.O.'s, F-1 Autopilot Operating Instructions, and all miscellaneous inspection forms.

1-100. STORAGE SPACE. The navigator's cabinet has four spaces for maps, charts, astrocompass, etc. There is a hook over the drift signal cabinet for the navigator's case.

1-101. DRIFTMETER. The Type B-3 driftmeter is to the left of the entrance door, aft of the navigator.

1-102. ASTROCOMPASS. A Type A-1 astrocompass can be mounted in four positions by moving the support in the astrodome.

1-103. DRIFT SIGNALS. Six each of day and night drift signals are in the side-wall cabinet behind the navigator. When using the signal-release tube, put its cover on the drift signal cabinet (see decalled instructions).

1-104. DRINKING WATER CONTAINERS. There are two water breakers totaling 9 gallons in the left rear part of the control cabin; also paper cup and towel dispensers, waste cup and towel container, and wash basin.

1-105. TOILETS. There is a curtained permanent toilet and urinal in the front of the main cargo compartment, and a permanent urinal in the lower forward compartment. A toilet and urinal stored in the lower rear compartment are used in the rear of the main compartment when troops are being carried.

1-106. FIRE EXTINGUISHERS, FIRST-AID KITS, AXES, AND FLASHLIGHTS. (See *figure 3-1.*)

1-107. LIFE RAFT AND DINGHY RADIO. One E-2 seven-man life raft is in the right forward end of the main cargo compartment, with a SLR-578 dinghy radio just above it. Both raft and radio have instructions with them. The life-raft container opens only to the inside of the airplane.

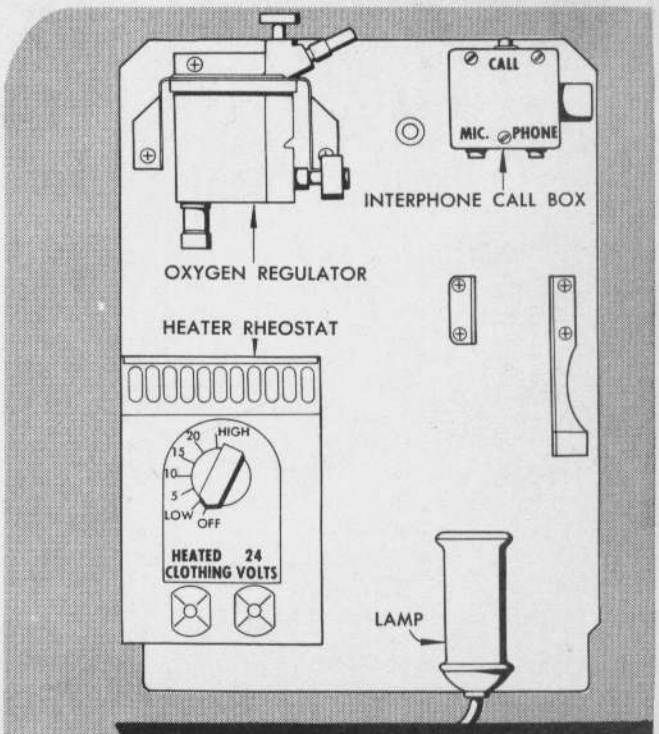


Figure 1-16. Engineer's Auxiliary Panel

17186

PILOT'S NOTES

Section II

NORMAL OPERATING INSTRUCTIONS

17503

Note

Space is provided after each paragraph in this section for pilot's notes on aircraft performance or operation.

2-1. BEFORE ENTERING THE PILOTS' COMPARTMENT.

2-2. RESTRICTIONS.

a. All acrobatics are strictly prohibited.

b. Do not exceed 300 MPH IAS at any time.

c. Do not exceed 220 MPH IAS with wing flaps extended 25 degrees.

d. Do not exceed 200 MPH IAS with landing gear extended.

e. Do not exceed 180 MPH IAS with wing flaps extended 45 degrees.

f. Do not exceed power-plant limitations as specified on the "Power Plant Chart," *figure 5-2.*

2-3. INITIAL CHECKS.

a. Complete weight and balance form F in "Handbook of Weight and Balance Data," AN 01-1B-40.

b. Obtain all weather data and complete clearance form.

c. Obtain ground-crew report.

d. Inspect outside of airplane.

e. Inspect landing gears.

f. Remove any frost, ice, snow, or dust from wings and tail surfaces.

g. Check that pitot-tube covers, landing-gear down locks, and air-intake duct plugs are removed.

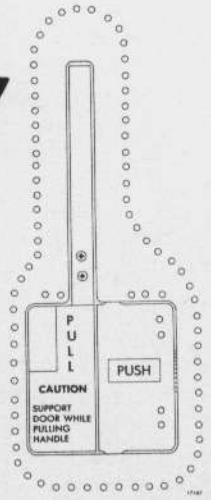


Figure 2-1. Entrance Door Latch

2-4. ENTERING THE AIRPLANE. Entrance is gained through a door on the left side of the lower forward compartment or through a door also on the left side of the lower rear cargo compartment. Ladders adjacent to each entry door provide access to the main cargo compartment through hatches in the floor. The control cabin is entered through the forward bulkhead door in the main cargo compartment. Another means of entrance to the airplane is through the main cargo doors when the ramps are lowered.

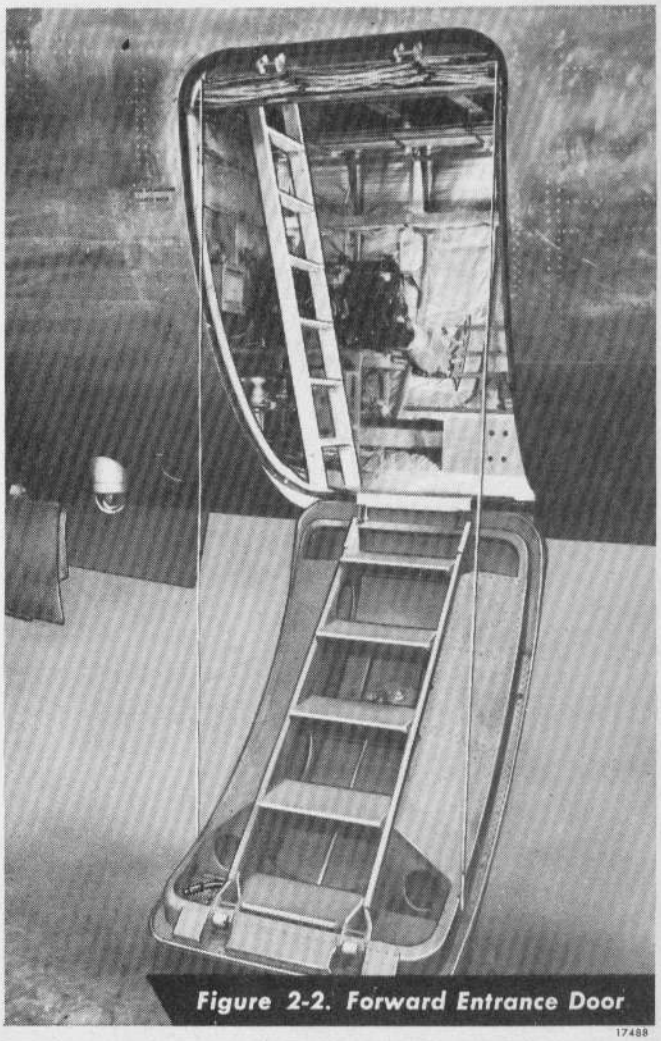


Figure 2-2. Forward Entrance Door

17488

2-5. ON ENTERING PILOTS' COMPARTMENT.

PILOT	COPILOT	ENGINEER
	(1) Airplane inspection	(1) Airplane inspection
(2) Check Form 1 and 1A	(2) Check Form 1 and 1A	(2) Check Form 1 and 1A
		(3) Close entrance doors
(4) Check parachute, clothing, and life preserver	(4) Check parachute, clothing, and life preserver	(4) Check parachute, clothing, and life preserver
(5) Check oxygen mask and oxygen pressure	(5) Check oxygen mask and oxygen pressure	(5) Check oxygen mask and oxygen pressure
(6) Ignition switches "OFF"	(6) Have propellers pulled through	
(7) Close circuit breakers	(7) Close circuit breakers	(7) Close circuit breakers
(8) Parking brakes "ON"	(8) Landing-gear switch "DOWN"	(8) Note if external power is plugged in; if so, do not turn auxiliary power-plant generator on.
(9) Chocks in place	(9) Chocks in place	(9) START auxiliary power plant
(10) Control-surface lock "UNLOCKED"	(10) Battery switch "ON"	(10) Place auxiliary power-plant generator switch "ON"
(11) Flight controls checked for movement	(11) Check inverter warning lights "ON"	(11) Check hydraulic-fluid tank gage full
(12) Emergency cabin-pressure release handle "DOWN"	(12) Check MAIN and EMERGENCY hydraulic pressure 1025 to 1225 PSI	(12) Place hydraulic-pump switch on "MANUAL", then "AUTO"
(13) Check emergency alarm	(13) "CLOSE" hydraulic charging handle when emergency pressure is 1025 to 1225 PSI	(13) Emergency cabin air "OPEN"
(14) Autopilot "OFF"	(14) Check fuel-quantity gages against dip-stick readings	(14) Vacuum Selector handle—"No. 2 ON" or "No. 3 ON"
(15) Set altimeter	(15) Check oil-quantity gages—80 gallons	(15) Pitot-heat switches "OFF"
	(16) Emergency fuel-shutoff switches "OPEN"	(16) Deicer switch "OFF"
	(17) Oil-shutoff switches "OPEN"	(17) Anti-icing switch "OFF"
	(18) Set altimeter	(18) Engine generator switches "OFF"

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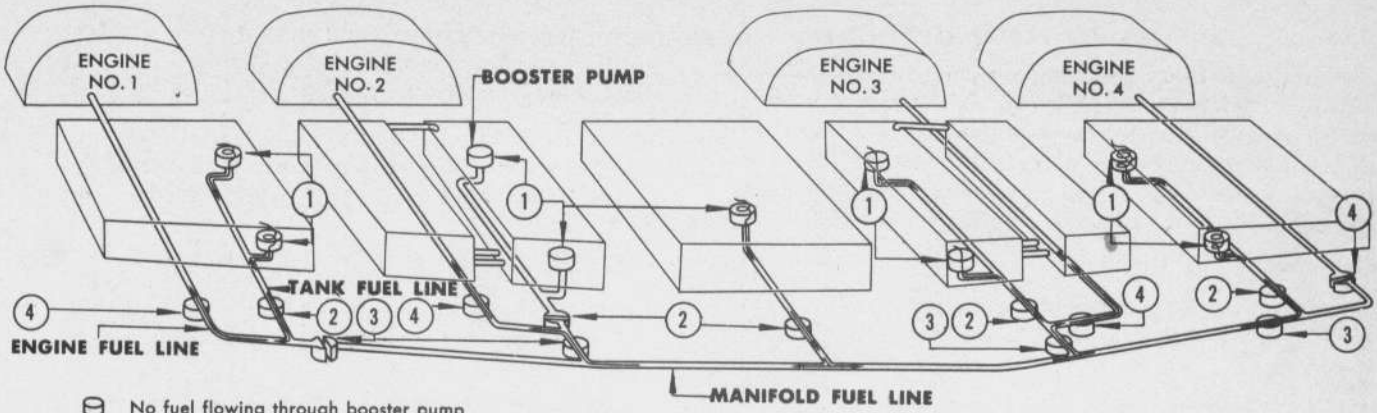
2-6. FUEL-SYSTEM MANAGEMENT.

2-7. FUEL-SYSTEM NORMAL OPERATION. Place all main tank emergency fuel shutoff-valve switches in "OPEN," all manifold valve switches and the center tank valve switch in "CLOSE," and all booster pump switches in "OFF." However, when taking-off, landing or flying above 10,000 feet place the booster-pump switches in "NORMAL." When the fuel is low in any tank, place both booster-pump switches for that tank in "NORMAL" to minimize the amount of fuel that will be trapped. Fuel in the main tanks can be balanced by placing all manifold shutoff-valve switches in "OPEN," the booster-pump switches for the tank with the least fuel in "OFF" and the other main tank booster-pump switches in "NORMAL." This stops the flow of fuel from the tank with the least fuel. Fuel in the main tanks can be balanced without operating the booster pumps by placing all manifold shutoff-valve switches in "OPEN" and the tank shutoff-valve switch for the tank with the least fuel in "OFF." The engines then use fuel from the other three main tanks through the manifold line.

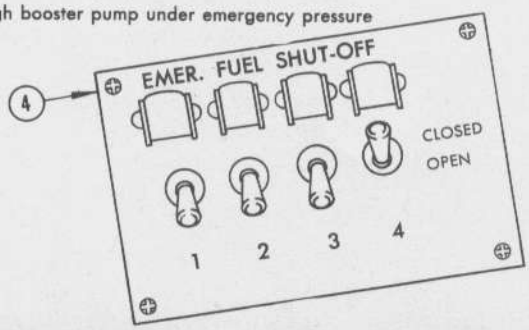
CAUTION

When operating any shutoff-valve switches watch the fuel-pressure indicators closely for any drop in fuel pressure, indicating that fuel has been shut off from the engine.

2-8. FUEL-SYSTEM CENTER TANK OPERATION. After reaching a safe altitude, use the fuel in the center tank first to reduce the bending moment in the wing. This is done by placing all manifold-valve switches and the center tank valve switches in "OPEN," the center tank booster-pump switch in "NORMAL," and all main tank booster-pump switches in "OFF." DO NOT CLOSE THE MAIN TANK SHUTOFF VALVES. When the center tank is nearly empty place one booster-pump switch for each main tank in "NORMAL." The main tank booster pumps will then maintain pressure in the manifold line when the center tank is empty and prevent air from getting into the manifold line. When any tank becomes empty place its booster-pump switches in "OFF" to prevent excessive wear on the booster pumps and place its tank shutoff-valve switch in "OFF" to prevent any air from the empty tank from getting into the manifold line, in case all booster pumps stop.



No fuel flowing through booster pump
Fuel flowing without booster pump pressure
Fuel flowing through booster pump under normal pressure
Fuel flowing through booster pump under emergency pressure



TYPICAL SWITCH AND VALVE POSITIONS

FUEL TANK CAPACITIES

NO. 1 ENGINE TANK	1420 U.S. GALLONS
NO. 2 ENGINE TANK	1510 U.S. GALLONS
NO. 3 ENGINE TANK	1510 U.S. GALLONS
NO. 4 ENGINE TANK	1420 U.S. GALLONS
CENTER TANK	1195 U.S. GALLONS
TOTAL	7055 U.S. GALLONS

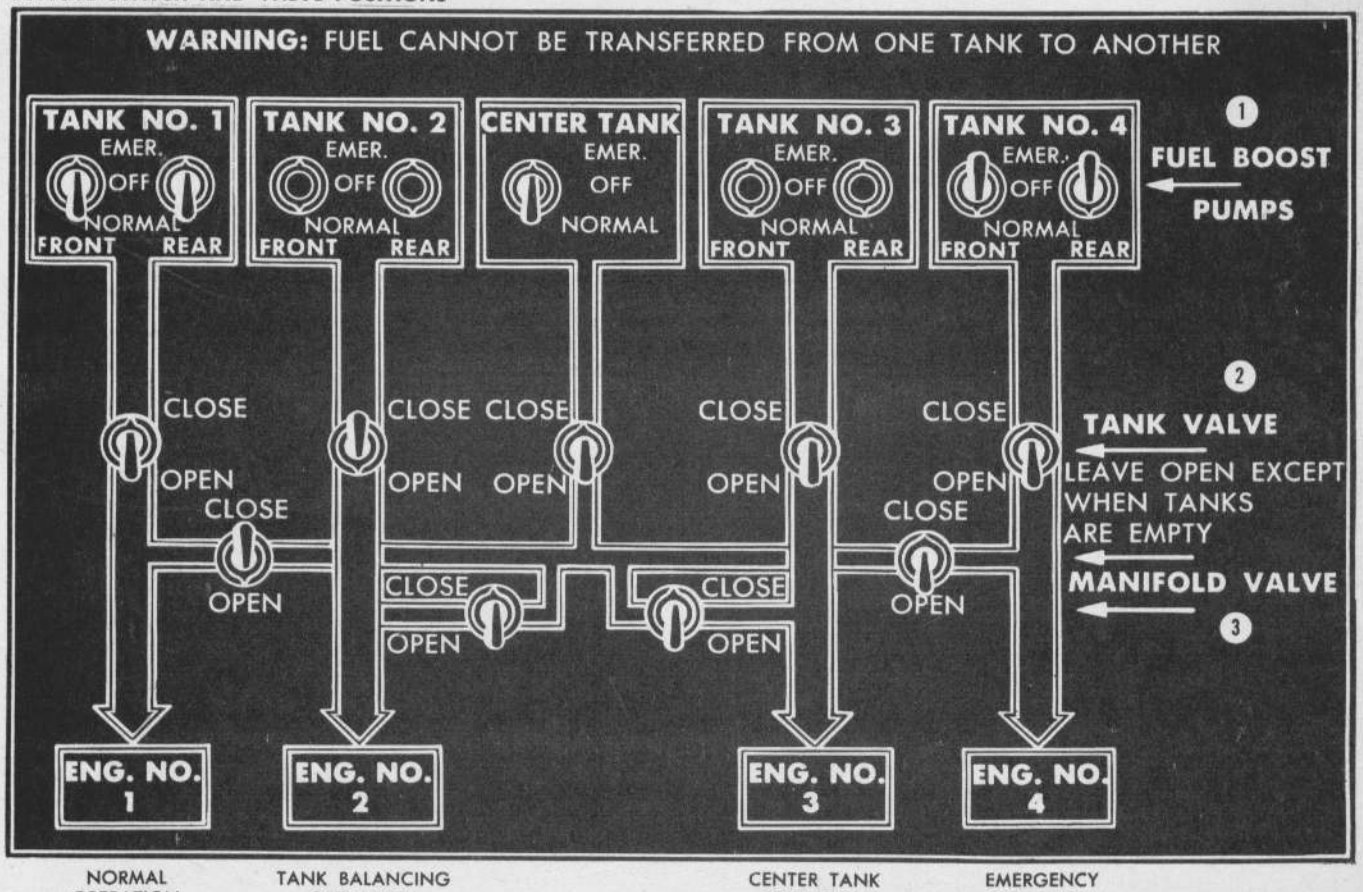


Figure 2-3. Fuel System Management

17898

2-9. AUXILIARY POWER-PLANT OPERATION.

2-10. The auxiliary power plant may be started electrically or when electrical power is not available, by a cord wound on the flywheel pulley. For manual starting, the auxiliary power plant must start on what fuel is in the carburetor bowl. As soon as the engine starts the power from the generator will open the fuel valve.

2-11. PRE-START CHECK.

a. Examine the exterior of the auxiliary power plant for loose parts, oil leaks, fuel leaks, and loose electrical connections.

b. Check the oil level with the bayonet gage under the oil filler cap. The oil level should be up to the "F" mark on the gage.

2-12. ELECTRICAL STARTING PROCEDURE.

a. Turn the auxiliary power-plant generator switch on the pilots' and engineer's overhead switch panel "OFF."

b. Turn the battery switch on the pilot's compass panel "ON."

c. Open the exhaust-duct valve.

d. Turn the auxiliary power-plant ignition switch "ON."

e. Hold the starter switch, which is on the auxiliary power-plant control shield, in the "ON" position and choke as necessary.

f. The auxiliary power plant has a manual control lever for the governor and choke. This lever controls the choke when moved to the left of the "IDLE" position, and controls the speed when moved to the right. Operation of the manual choke can best be determined by experience. As a result of the relatively high cranking speed little or no choking is necessary at temperatures above 50°F (10°C). At lower temperatures it may be necessary to choke fully until the engine starts, then run with the choke partly closed until the engine warms up. Do not place the choke lever in the "RUN" position until the engine is warm.

g. Allow the auxiliary power plant to idle for approximately five minutes and run for an additional two or three minutes before turning the auxiliary power-plant generator switch "ON."

2-13. MANUAL STARTING PROCEDURE.

a. Turn the auxiliary power-plant generator switch on the pilots' and engineer's overhead switch panel "OFF."

b. Turn the battery switch on the pilot's compass panel "ON."

c. Open the exhaust-duct valve.

d. Turn the auxiliary power-plant ignition switch "ON."

e. Operate the choke control as in the electrical starting except that more choking will be necessary than when cranking electrically.

f. Wind starter cord around the pulley and pull from any convenient angle. (Leave the starter switch "OFF" when cranking manually.)

g. Allow the auxiliary power-plant engine to idle for approximately five minutes and run at operating speed for an additional two or three minutes before turning the auxiliary power-plant generator switch "ON."

2-14. ADJUSTMENT FOR ALTITUDE. At various altitudes it will be necessary to change the carburetor mixture by adjusting the altitude valve. Set the pointer opposite the figure nearest to the altitude at which the engine is operating.

2-15. STOPPING AUXILIARY POWER PLANT.

a. Turn the accessory power-plant generator switch "OFF."

b. Allow the accessory power-plant engine to idle for approximately five minutes to allow cylinder-head temperatures to decrease.

c. Turn the auxiliary power-plant ignition switch "OFF."

d. After the engine has stopped, close the exhaust-duct valve.

Note

The exhaust-duct valve must be closed to allow pressurization of the airplane.

2-16. STARTING ENGINES.

PILOT	COPILOT	ENGINEER
(1) Master-synchronizer switch "ON"	(1) Mixture controls "AUTO RICH"	(1) Oil-cooler flap switches "AUTO"
(2) Propeller-selector switches "AUTO"		(2) Cowl flaps "OPEN"
(3) Turn master-synchronizer knob to 2800 RPM		(3) Intercooler flaps "OPEN"
(4) Throttles set to 1000 RPM		(4) **Main** "TANK VALVE" switches "OPEN"
(5) Turbo-boost selector to "0"		(5) "MANIFOLD VALVE" switches and **center** "TANK VALVE" switch "CLOSED"
(6) Check reverse switches "NORMAL"		
(7) Close master pull ignition switch	(7) Check fire guard	(7) Starting sequence 2-1-3-4
(8) Check fire guard	(8) Set engine fire-extinguisher selector to engine No. 2	(8) Ready to start engine No. 2
(9) Receive engineer's report		(9) Booster-pump switches for engine No. 2 on "NORMAL"
(10) Request "All Clear" signal from ground crew for engine start		(10) Accelerate starter at least 20 seconds
		(11) Move starter switch from "ACCEL" to "START"
(12) Turn ignition switch for engine No. 2 to "BOTH"		(12) Prime as needed
		NOTE If engine fails to start within ten revolutions, STOP and allow starter to cool for at least one minute before repeating above procedure.
		(13) Check oil pressures; if no indication is registered within 10 seconds STOP engine and investigate
		(14) Booster-pump switches "OFF" when engine is running smoothly
(15) Turn ignition switch to "BOTH" for next engine	(15) Reset fire-extinguisher selector to next engine	(15) Start remaining engines as above
	(16) Turn fire-extinguisher selector to "OFF"	
	(17) Have external power source disconnected, if used	

For engine fire during starting, see paragraph 3-7, section III, "Emergency Operating Instructions."

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2-17. WARM-UP.

PILOT	COPILOT	ENGINEER
(1) Run engines at 1000 RPM until oil pressures stabilize and oil temperature reaches 50°C	(1) Check instruments	
NOTE Do not exceed 220°C cylinder - head temperature during ground operation	(2) Place the EMERGENCY FUEL-SHUTOFF switches in "CLOSE," one at a time, and return to "OPEN" as soon as the fuel pressure begins to drop	
(3) Depress manifold-pressure purge valves for at least 30 seconds	(3) Check for operation of both magnetos	
(4) Check instruments		

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2-18. GROUND TEST.

PILOT	COPILOT	ENGINEER
(1) Advance throttles to 1800 RPM		
(2) Decrease master-synchronize control to indicate 1500 RPM; all four engine tachometers should decrease to 1500 RPM without surging; then increase synchronizer control to full "INCREASE RPM"; the engine tachometers should increase to 1800 RPM		(2) Place engine generator switches "ON"
(3) Hold each propeller-selector switch in "DECREASE RPM" until the engine tachometer indicates 1500 RPM; then move switch to "INCREASE RPM" until 1800 RPM is indicated; then release switch		(3) Move generator selector to each position for a voltmeter indication of 28 volts
(4) Place each feathering switch in "FEATHER" and return to "NORMAL" as soon as 1500 RPM is indicated, then increase RPM to 1800 with selector switch and move switch to "AUTO"		(4) Place inverter switch on "SPARE" first, then on "MAIN"; check that the inverter warning lights go out
(5) Reduce throttles to about 1000 RPM; do not exceed 1200 RPM		(5) Move vacuum selector from one inboard engine to the other; check suction gage indicates 3.8 to 4.2 inches
NOTE An increase of RPM followed by a decrease of RPM indicates propeller reversal	(6) Place inboard propeller-reversing switches in "REVERSE"	(6) If deicer boots are installed, place deicer switch "ON" and visually check boot operation; check deicer pressure indicator between 6 and 8.5 PSI
CAUTION Close the throttles and return the reversing switches to "NORMAL" immediately if propeller continues to over-speed	(7) Push reverse actuator button	(7) CLOSE the **main tank** valves, one at a time, and OPEN when the fuel pressure drops, indicating positive tank valve operation
	(8) Return inboard propeller-reversing switches to "NORMAL"	(8) OPEN the **center tank** valve and **all manifold** valves, switch **center tank fuel-boost pump** to "EMERGENCY"; note fuel-pressure rise on all engines, indicating manifold-valve operation
(9) Repeat the above procedure for the outboard engines	(9) Repeat the above procedure for the outboard engines	(9) CLOSE **all manifold** valves and **center tank** valve, switch **center tank fuel-boost pump** to "OFF"
(10) Reduce throttles to 800 RPM for ignition grounding check	(10) Turn ignition switch for each engine from "BOTH" to "OFF" and back to "BOTH"	
(11) Increase throttles to 2200 RPM	(11) Check magnetos by turning ignition switch for each engine from "BOTH" to "RIGHT"; note RPM drop and return switch to "BOTH"; when RPM is normal, turn to "LEFT"; note RPM drop and return switch to "BOTH"; normal drop is 60 to 80 RPM; maximum, 100 RPM	

2-18. GROUND TEST (CONTINUED).

PILOT	COPILOT	ENGINEER
(12) With turbo-boost selector on "0," advance throttles, one at a time, to full open; manifold pressure should be between 39 and 43 inches; the tachometers should indicate between 2550 and 2650 RPM; while at full throttle, turn turbo-boost selector to "8" and adjust manifold pressure for take-off with calibrating knobs **NOTE** To stabilize manifold pressure at 49 inches on take-off, set turbo-boost calibrating knobs 1-1/2 inch less for each 100 RPM below 2800 RPM on ground test	(12) Check fuel flow meter during engine runup; indicators should read within 100 pounds per hour of each other	(12) Check generator output for each engine being run up
(13) Reduce each throttle to 1000 RPM as each engine is checked		(13) Check fuel and oil pressures, oil and cylinder-head temperatures
(14) Advance throttle on coolest engine for generator power to check wing-flap operation	(14) Wing-flap switch "DOWN" until flaps are full down; then "UP" until 25° is indicated; then "OFF"	

17928

2-19. BEFORE TAXIING.

PILOT	COPILOT	ENGINEER
(1) Check instruments	(1) Check instruments	
	(2) Landing-gear switch "DOWN"	
(3) Gyros uncaged	(3) Gyros uncaged	
	(4) Radio call completed	
(5) Chocks removed	(5) Chocks removed	
(6) Brakes "OFF"		

17929

2-20. TAXIING.

2-21. This airplane has taxiing characteristics similar to any large airplane with a tricycle landing gear. Taxi at 1000 RPM and use the brakes for turning. The nose gear swivels 136 degrees; 68 degrees either side of center, and is self-centering within 15 degrees either side of center. When turning the airplane, keep both main landing gears moving; pivoting the airplane on one main landing gear causes excessive stresses on the landing gear and wear on the tires.

2-22. BEFORE TAKE-OFF.

PILOT	COPILOT	ENGINEER
(1) Head airplane into wind with nose wheel straight		
(2) Ground test engines, if not done previously		
(3) Windows closed	(3) Windows closed	(3) Doors and hatches closed
(4) Set trim tabs	(4) Check front and rear oil pressures, and fuel pressures	(4) Generator switches "ON"
(5) Propellers High RPM	(5) Check cylinder head and oil temperatures	(5) Intercooler flaps halfway (7-1/2 degrees)
(6) Mixture controls "AUTO RICH"	(6) Wing flaps 25 degrees	(6) Oil-cooler flap switches "AUTO"
(7) Turbo-boost selector "8"	(7) Radio call completed	(7) All main tank "FUEL BOOST PUMP" switches "NORMAL"
(8) Throttle friction brake adjusted		(8) Check all **main** "TANK VALVE" switches "OPEN" and all "MANIFOLD VALVE" switches and **center** "TANK VALVE" switch in "CLOSE"
		(9) Cowl flaps 5 degrees

17930

2-23. TAKE-OFF.

PILOT	COPILOT	ENGINEER
(1) If warning horn blows when throttles are opened, STOP the airplane and taxi back.		
	(2) Check wing-flap and cowl-flap position and set correctly if warning horn blows	
	(3) Maximum operating limits are 49 inches and 2800 RPM	(3) Check all pressures, temperatures, and RPM

For turbosupercharger overboost, runaway propeller, and engine failures on take-off, see paragraphs 3-12, 3-14, 3-16, Section III, "Emergency Operating Instructions."

17931

2-24. AFTER TAKE-OFF.

PILOT	COPILOT	ENGINEER
(1) When airborne apply brakes and signal landing gear up	(1) Upon signal from pilot place landing-gear switch "UP"	(1) Check ammeters
(2) When sufficient air speed is gained, reduce manifold pressure to 43.5 inches with turbo-boost selector	(2) Place landing-gear switch "OFF" when landing gear is up	(2) Adjust cowl flaps as required
	(3) When sufficient altitude and speed are gained place wing-flap switch "UP," and "OFF" when flaps are up	

17932

2-25. CLIMB.

PILOT	COPILOT	ENGINEER
(1) Climb only as necessary until the airplane has an air speed of 195 MPH IAS		(1) After airplane has reached a safe altitude stop auxiliary power plant
		(2) Booster-pump switches "OFF" (above 10,000 feet booster-pump switches on "NORMAL" to prevent vapor locks)
		(3) Adjust cowl flaps as required

17933

2-26. DURING FLIGHT.

PILOT	COPILOT	ENGINEER
(1) After leveling out establish cruising-power conditions		(1) As soon as practicable place **all** "MANIFOLD VALVE" switches and **center** "TANK VALVE" switches in "OPEN" and the **center tank** "FUEL BOOST PUMP" switch on "NORMAL" (if other booster-pump switches are on "NORMAL," place **center tank** booster-pump switch on "EMERGENCY"); do not close **main tank valves**

17934

2-27. AUTOMATIC-PILOT OPERATION.

2-28. ENGAGING AUTOMATIC PILOT.

a. Trim all control surfaces for level flight.

b. Center all controls on the turn-and-pitch controller.

c. Uncage the vertical control gyro.

d. Turn the automatic-pilot power switch "ON."

e. Press the automatic-pilot clutch switch "ON."

2-29. DISENGAGING AUTOMATIC PILOT. There are three electrical ways and one manual method to turn off the automatic pilot. The three electrical methods are (1) pressing the release switch on either control column, or (2) caging the vertical gyro, or (3) turning off the autopilot power switch. To disengage the automatic pilot manually, pull the servo emergency-disconnect handle on the engine control stand.

2-30. NIGHT FLYING.

2-31. Check all lights for satisfactory operation. Night operation in this airplane is conventional.

2-32. STALLS.

2-33. The stalling characteristics of this airplane are normal under all conditions. Unmistakable stall warning in the form of buffeting occurs well in advance of the actual stall. Aileron control is good and is sufficient to correct any wing heaviness that occurs during the buffeting preceding the stall. There is little tendency to yaw during a stall and the pitching is very moderate, permitting complete recovery with minimum loss of altitude. Power can be used during the recovery provided the usual precautions are taken to prevent a secondary stall. All controls should be used normally during the entire stall.

2-34. SPINS.

2-35. Intentional spins with this airplane are prohibited. In case an accidental spin occurs, use the normal procedure for any airplane to recover, avoiding as much as possible a high airspeed during the pullout.

2-36. ACROBATICS.

2-37. All acrobatics are prohibited with this airplane.

2-38. DIVES.

2-39. Do not exceed 300 MPH IAS at any time.

2-40. APPROACH.

PILOT	COPILOT	ENGINEER
(1) Receive engineer's CG report		(1) Check weight and CG limits
(2) Autopilot "OFF"	(2) Apply brakes and check hydraulic pressures	(2) Start auxiliary power plant and place its generator switch "ON"
(3) Master propeller synchronizer set to 2400 RPM	(3) Mixture controls "AUTO RICH"	(3) Deicer switch "OFF"
(4) Turbo-boost selector on "8"		(4) Anti-icer switch "OFF"
(5) Signal for landing-gear extension when speed is reduced	(5) Landing gear "DOWN"	(5) **Main** fuel "TANK VALVE" switches "OPEN"
(6) Signal for extension of wing flaps	(6) Check warning light for landing gear down and locked	(6) **Center** "TANK VALVE" and **all** "MANIFOLD VALVE" switches "CLOSED"
	(7) Wing flaps "DOWN" 25 degrees or as desired; place switch in "OFF"	(7) "FUEL BOOST PUMP" switches for the main tanks on "NORMAL"
	(8) Stand by to place propeller reverse-pitch switches in "REVERSE"	(8) Intercooler flaps halfway (7 1/2 degrees)
		(9) Cowl flaps "CLOSED"

17935

2-41. GO AROUND.

PILOT	COPILOT	ENGINEER
(1) Apply throttles smoothly	(1) Landing gear "UP" (2) Raise wing flaps carefully to 25 degrees	(1) Open cowl flaps to 5 degrees

17936

2-42. LANDING.

PILOT	COPILOT	ENGINEER
(1) Contact ground in conventional landing manner	(1) Stand by to use propeller-reversing switches as directed by pilot (2) Wing flaps "UP" when ground roll is slowed sufficiently	(1) Cowl flaps "OPEN" when ground contact is made (2) Intercooler flaps "OPEN"
(3) Turbo-boost selector "0"	(3) Propeller-reversing switches "NORMAL"	(3) Fuel-booster pumps "OFF"
(4) Master synchronizer 2800 RPM		

For emergency landings, see paragraphs 3-31, 3-35, 3-36, section III, "Emergency Operating Instructions."

17937

2-43. STOPPING ENGINES.

PILOT	COPILOT	ENGINEER
(1) Chocks in place	(1) Chocks in place	
(2) Increase throttles to 2200 RPM for magneto check, then reduce to 800 RPM until the cylinder-head temperatures drop below 190°C	(2) Check magnetos	
(3) Cage gyros	(3) Cage gyros	(3) Dilute oil, if necessary
(4) Increase throttles to 1200 RPM for 15 seconds (unless oil is being diluted)	(4) Mixture controls "FUEL CUTOFF"	(4) All generators "OFF"
(5) Throttles "CLOSED"	(5) Ignition "OFF"	(5) Stop auxiliary power plant
NOTE Do not set parking brakes while warm	(6) Radios "OFF" (7) Surface-control lock "LOCKED" (8) Landing-gear switch "DOWN"	(6) All switches "OFF"

17938

2-44. OIL DILUTION.

PILOT	COPILOT	ENGINEER
		(1) If a temperature of 4.4°C (40°F) or lower is expected before the next engine start, dilute the oil as follows:
(2) Advance throttles to 1200 RPM if oil temperatures are below 40°C	(2) Check for drop in fuel pressure indicating that the oil is being diluted; if pressure does not drop, investigate the cause	(2) Place the individual oil-dilution switches "ON" and hold master oil-dilution switch "ON" according to the following table: 4.4°C to —12.2°C (40°F to 10°F) 2 to 4 minutes —12.2°C to —28.9°C (10°F to —20°F) 4 to 6 minutes —28.9°C (—20°F) and lower 6 to 8 minutes **NOTE** Hold master dilution switch "ON" continuously during engine operation to insure complete dilution
(3) If impossible to maintain oil temperatures below 40°C, divide dilution periods into 3-minute intervals, shutting down long enough for temperature to drop below 40°C		
(4) Increase throttles to 1400 RPM during the last 30 seconds of oil dilution		
	(5) Move mixture controls to "FUEL CUTOFF" when the oil dilution period is completed	(5) Place all oil - dilution switches "OFF" after the engines are stopped

17939

2-45. BEFORE LEAVING PILOTS' COMPARTMENT.

PILOT	COPILOT	ENGINEER
(1) Parking brake "OFF," if wheels are chocked	(1) Landing-gear switch "DOWN"	(1) All switches "OFF"
(2) Windows closed	(2) Wing-flap switch "OFF"	(2) Fill out Forms 1 and 1A
	(3) Surface controls "LOCKED"	(3) Pitot covers and land-gear down locks in place
	(4) Window closed	

17940

PILOTS' NOTES

Section III

EMERGENCY OPERATING INSTRUCTIONS

17504

3-1. EMERGENCY EQUIPMENT.

3-2. The emergency equipment, described in section I under "Miscellaneous Equipment," is located in the airplane as shown in *figure 3-1.*

3-3. The life-raft container opens only to the inside of the airplane. In case of a ditching the life raft and dinghy radio must be removed from, the airplane through an emergency exit and the life raft inflated outside. Instructions are included with both the life raft and dinghy radio.

3-4. EMERGENCY EXITS AND ENTRANCES.

3-5. After a crash landing on the ground any normal exit or entrance to the airplane may be used. The control-cabin sliding windows, the escape hatches and the astrodome should be used as emergency exits after a ditching and may also be used as emergency exits on the ground. In flight, emergency exit should be made in accordance with *figure 3-3.* Emergency entrance to the airplane may be made by cutting through the structure at locations shown in *figure 3-2* and marked in red on the outside of the fuselage.

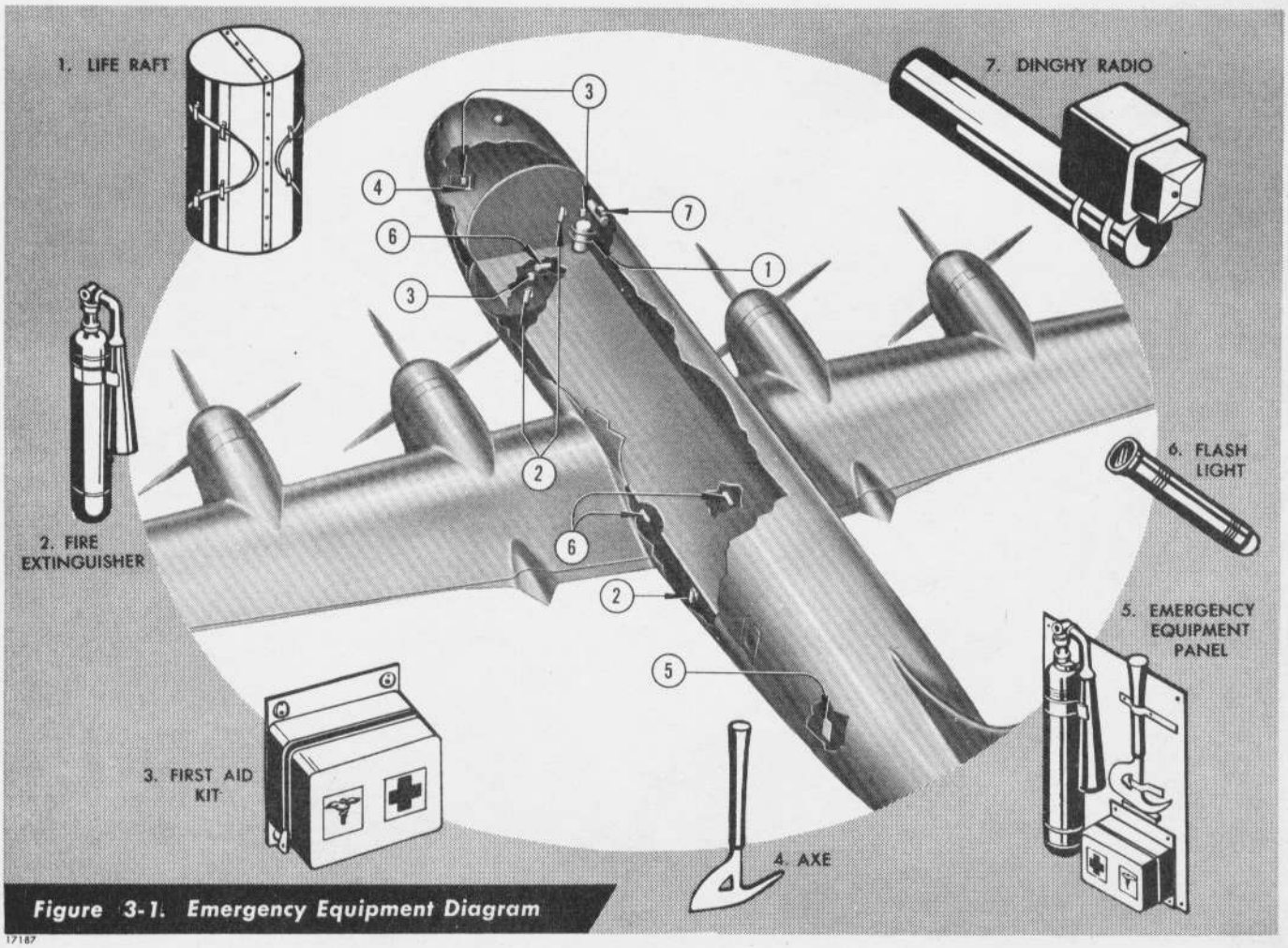

Figure 3-1. Emergency Equipment Diagram

17187

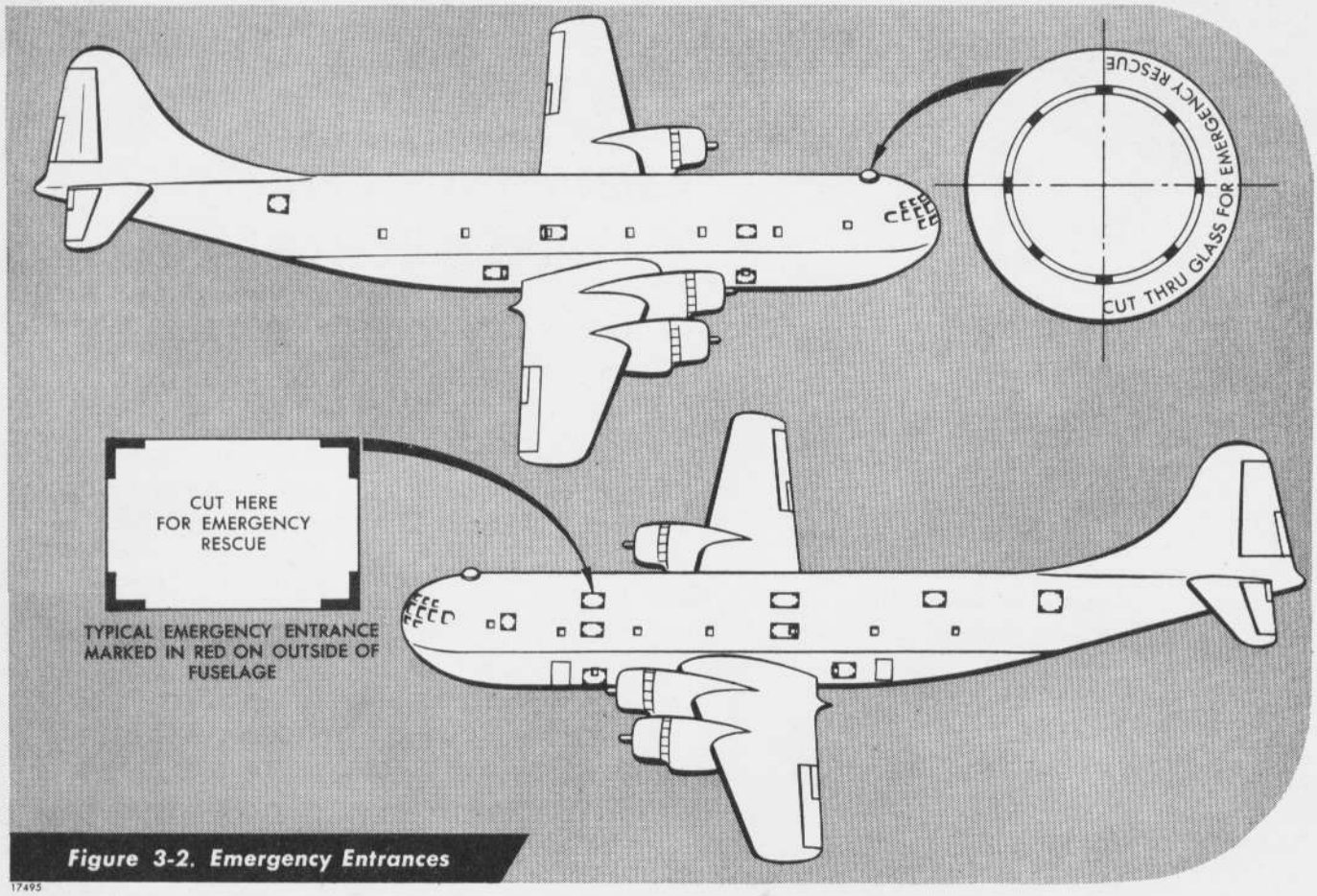

Figure 3-2. Emergency Entrances

17495

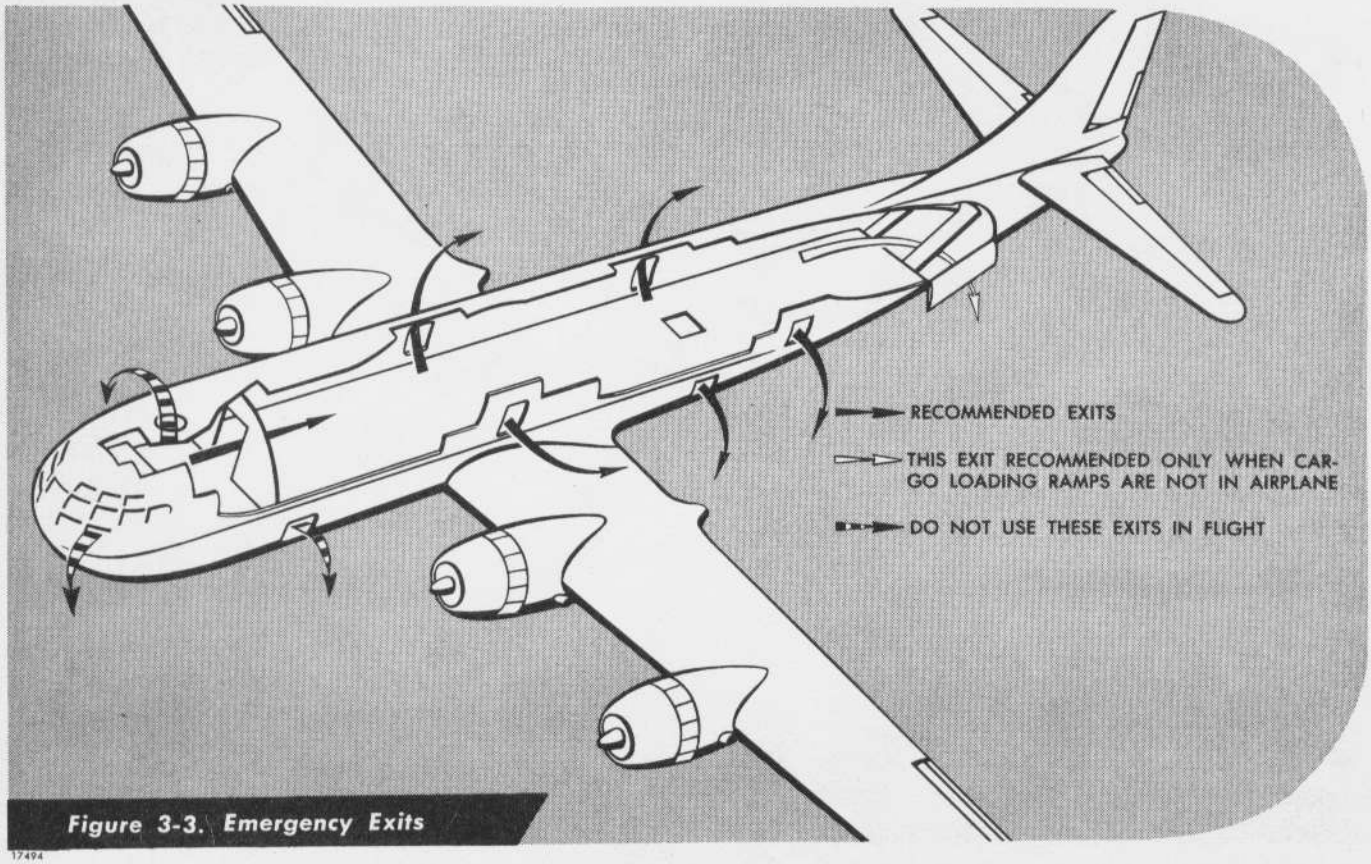

Figure 3-3. Emergency Exits

17494

3-6. FIRES.

3-7. ENGINE FIRE DURING STARTING.

3-8. If an engine fire occurs during the starting procedure, before the engine starts, move the mixture control to "FUEL CUTOFF" and keep the engine rotating with the starter to draw the fire out through the exhaust. If the fire continues or spreads, stop the engine and pull the engine fire extinguisher handle for the engine on fire. If an engine fire occurs during the starting procedure, after the engine has started, move the mixture control to "FUEL CUTOFF," place the emergency fuel shutoff-valve switch in "CLOSE," close the throttle, and place the boost-pump switches in "OFF." If the fire continues or spreads, pull the engine fire-extinguisher handle.

3-9. FUSELAGE FIRE IN FLIGHT.

3-10. Keep the control cabin windows and all doors CLOSED to isolate and minimize the fire. Use the hand fire extinguishers, *figure 3-1.*

3-11. ENGINE FIRE IN FLIGHT.

PILOT	COPILOT	ENGINEER
(1) Alert crew and passengers to stand by to abandon airplane if necessary	(1) CLOSE emergency fuel and oil shutoff vales on burning engine	(1) Open cowl flaps halfway (7-1/2 degrees)
(2) CLOSE throttle on burning engine	(2) FEATHER propeller	(2) CLOSE the **fuel tank** and **manifold** valves of burning engine and turn the **fuel-boost pump** switch OFF
	(3) Mixture in "FUEL CUTOFF" on burning engine	(3) CLOSE emergency cabin-air valve on the respective side
	(4) Ignition for burning engine "OFF"	

17943

3-12. TURBOSUPERCHARGER OVERBOOST DURING TAKE-OFF.

3-13. If the manifold pressure is excessive during take-off and there is sufficient runway ahead, stop the airplane. If there is not sufficient runway ahead, close the throttle until the manifold pressure is within safe limits, continue the take-off, and land as soon as possible.

3-14. RUNAWAY PROPELLER DURING TAKE-OFF.

3-15. If the RPM is excessive during take-off and there is sufficient runway ahead, stop the airplane. If there is not sufficient runway ahead, close the throttle until the RPM is within safe limits, continue the take-off, and land as soon as possible. If closing the throttle does not reduce the RPM, feather the propeller immediately. Momentary overspeeding will sometimes occur when the throttles are opened rapidly and should not be confused with a runaway propeller. The propeller synchronizer should correct any momentary overspeeding.

3-16. ENGINE FAILURE ON TAKE-OFF.

PILOT	COPILOT	ENGINEER
(1) CLOSE throttles and apply brakes if sufficient runway remains or below safe three-engine speed		
(2) Use propeller reverse thrust if necessary	(2) Propeller - reverse switches on "REVERSE" and press reverse actuator switch if ordered by pilot	
CAUTION Do not allow airplane to back up when using reverse thrust	(3) Master ignition and battery switches "OFF" if ordered by pilot	(3) Generator switches "OFF" if co-pilot turns ignition and battery switches "OFF"
(4) Maintain directional stability if safe flying speed is reached	(4) Landing gear "UP," and flaps "UP" if airspeed is sufficient	
(5) CLOSE throttle on failed engine	(5) FEATHER propeller on failed engine	
(6) Climb only as necessary to clear obstructions, to allow airspeed to build up	(6) Mixture in "FUEL CUTOFF" on failed engine	(6) CLOSE the failed engine's fuel "TANK VALVE" switch and place the tank's "FUEL BOOST PUMP" switches "OFF"
	(7) Ignition "OFF" on failed engine	(7) Cowl flaps on failed engine "CLOSED"
	(8) CLOSE emergency fuel and oil shutoff valves on failed engine	

17944

3-17. ENGINE FAILURE IN FLIGHT.

3-18. Trim the airplane with rudder first, and then ailerons for directional stability. Feather the engine in accordance with step (5) and on, in preceding paragraph entitled "Engine Failure on Take-off." To unfeather, return feathering switch to "NORMAL," with selector switch out of "AUTO," then hold selector in "INCREASE RPM" until warmup RPM is reached. After warmup period, increase propeller to normal speed with selector in "INCREASE RPM," then move selector to "AUTO."

3-19. FUEL-SYSTEM EMERGENCY OPERATION.

3-20. If a fuel tank ruptures, place all "MANIFOLD VALVE" switches in "OPEN," both "FUEL BOOST PUMP" switches for the ruptured tank in "EMERGENCY," and all other "FUEL BOOST PUMP" switches in "OFF." When the ruptured tank is nearly empty, place the booster-pump switches for the other tanks in "NORMAL," and when it is completely empty place its "TANK VALVE" switch in "CLOSE" and its booster-pump switches in "OFF." If a booster-pump fails, place the other booster-pump switch for that tank in "NORMAL," or "EMERGENCY" if necessary, to maintain fuel pressure. When flying below 10,000 feet the engine-driven fuel pumps should maintain fuel pressure without any booster pumps, but above 10,000 feet one or both booster pumps are required to prevent vapor locks. Do not supply fuel to more than two engines from one tank without operating the booster pumps for that tank. If an engine-driven fuel pump fails, place one or both booster-pump switches for that engine tank in "EMERGENCY" to maintain fuel pressure. If an engine fails, place its emergency fuel shutoff -valve switch in "CLOSE" and all manifold-valve switches in "OPEN." This will allow the fuel in the tank for the failed engine to be used by the other engines through the manifold line. When all fuel is nearly gone, place all booster-pump switches in "NORMAL" and all tank-valve and manifold-valve switches in "OPEN." This will allow all engines to use any available fuel.

3-21. AUTOMATIC-PILOT EMERGENCY RELEASE.

3-22. If the normal methods of disengaging the automatic pilot fail, pull the emergency servo-disconnect handle on the engine control stand.

3-23. CABIN-PRESSURE EMERGENCY RELEASE.

3-24. The emergency release valve in the lower nose compartment, *figure 4-7,* is used to release cabin pressure in an emergency. A pull on the handle on the engine control stand will open the valve and allow the pressurized air to escape through the nose landing-gear well. The release handle will return to its normal position after the operation, but the emergency release valve will have to be reset and latched manually.

3-25. LANDING-GEAR EMERGENCY OPERATION.

3-26. MAIN GEAR AUXILIARY-MOTOR OPERATION. If the normal operation of the landing gear fails, the portable auxiliary wing-flap motor is used as follows:

a. Install the portable auxiliary wing-flap motor at the lower position on the landing gear emergency gear box.

b. Pull clutch handle all the way out and allow the swaged ball to drop behind the slit in the bracket.

c. Run the motor in the indicated direction until the stops engage. (A jar will occur and the motor clutch will start slipping.) One minute is required for retracting; 40 seconds for extending. ALWAYS RELEASE THE CLUTCH HANDLE IMMEDIATELY AFTER EMERGENCY OPERATION IS COMPLETED.

3-27. MAIN-GEAR MANUAL OPERATION.

a. Pull the clutch handle all the way out and allow the swaged ball to drop behind the slit in the bracket.

b. To lower the gear, insert the crank in the lower socket on the emergency gear box. Turn clockwise until the stops are engaged; 387 turns, taking 12 minutes, are required.

c. To raise the gear, insert the crank in the upper socket on the emergency gear box and turn clockwise until the stops engage. ALWAYS RELEASE THE CLUTCH HANDLE IMMEDIATELY AFTER MANUAL OPERATION IS COMPLETED.

3-28. NOSE-GEAR MANUAL OPERATION. If the normal operation of the nose gear fails, the nose gear is operated manually in the lower nose compartment as follows:

a. Insert crank in motor gear box socket.

b. Disengage the motor clutch as indicated.

c. Turn crank as indicated; 257 turns of the crank are required to extend or retract the nose gear. ALWAYS RETURN THE CLUTCH HANDLE TO THE ENGAGED POSITION AFTER MANUAL OPERATION IS COMPLETED.

3-29. WING-FLAP EMERGENCY OPERATION.

3-30. If the wing-flap motor is inoperative the portable auxiliary wing-flap motor is used as follows:

a. Place normal wing-flap switch "OFF."

b. Hold the emergency wing-flap switch in the desired position.

c. Release the emergency wing-flap switch when the correct amount of flaps is obtained.

3-31. LANDING WITH ENGINE FAILURES.

3-32. If it is necessary to land with one or more engines inoperative, trim the airplane as required, increase the power of the other engines as required to maintain flight, maintain more altitude during the approach than normal, and take particular care to avoid undershooting the runway. When a landing is assured lower the landing gear and the wing flaps and make a normal landing.

3-33. EMERGENCY OPERATION OF THE BRAKES.

3-34. Two sets of hand levers, one set on either side of the overhead switch panel, operate the brakes using the emergency hydraulic system. When using the emergency brakes apply them steadily; do not pump the hand levers. Pumping the hand levers will lower the hydraulic pressure rapidly. Only five or six applications of the emergency brakes are available with an emergency hydraulic pressure of 1025 to 1225 PSI.

3-35. LANDING WITH LANDING-GEAR FAILURE.

PILOT	COPILOT	ENGINEER
(1) Land with as light a gross weight as possible and after every effort to lower the landing gear has been made	(1) Open emergency exits, **figure 3-3**	(1) Open emergency exits, **figure 3-3**
NOTE Land with as much of the landing gear down as possible in preference to a gear-up belly landing; land on a concrete or hard - surface runway rather than on a dirt or soft surface		
(2) CLOSE throttles just prior to surface contact	(2) Lower wing flaps fully down when landing is assured	(2) Stop the auxiliary power plant before landing is attempted
	(3) As soon as surface contact is made, place mixture in "FUEL CUTOFF," master ignition "OFF," battery "OFF," and emergency fuel and oil shutoff switches on "CLOSE"	(3) As soon as surface contact is made, turn generators "OFF," booster pumps "OFF," and all fuel switches on "CLOSE"
	(4) Be ready to set engine fire extinguisher if necessary	

17945

3-36. LANDING WITHOUT BRAKES.

PILOT	COPILOT	ENGINEER
(1) Land as short as possible, and use propeller reverse thrust	(1) Place both inboard and outboard reverse switches in "REVERSE" on approach	
(2) Apply throttles immediately as soon as surge or increased RPM is indicated to prevent engines from stopping	(2) Press reverse-pitch actuator at the instant of surface contact	
NOTE An increased RPM followed by a decreased RPM indicates propeller reversal	**NOTE** Propeller reversal will not take place until surface contact is made and the main gear oleo switches are actuated	
CAUTION Do not allow airplane to back up when using reverse thrust	**NOTE** Due to safety switches on the landing gear, it is impossible to retract the landing gear on the ground during the landing run to prevent running off the end of the runway	

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PILOTS' NOTES

Section IV

OPERATIONAL EQUIPMENT

17502

4-1. COMMUNICATION AND RADIO-NAVIGATION EQUIPMENT.

4-2. The airplane is equipped with the following radios for communication and navigation: An interphone system, liaison radio, command radio, IFF radio, radio compasses, radio altimeter, marker-beacon radio and blind-landing radios.

4-3. INTERPHONE SYSTEM (AN/AIC-3). Interphone control boxes, C166/AIC-3, are at the pilot's, copilot's, navigator's, and radio-operator's stations. Interphone call boxes are at the following locations: one at the engineer's station, one on the right side of the main cargo compartment aft of the right forward emergency exit, one at the cargo-loading doors, one on the right side of the nose-wheel well, another at the auxiliary power plant, and one above the rear wing spar in the lower rear cargo compartment. The call box at the engineer's station does not have a headset hanger and the box in the nose-wheel well does not have a "CALL" button. An F-21/ARA-9 filter is adjacent to each C166/AIC-3 interphone control box. The range filter allows either the range or voice to be eliminated as desired, or combines them.

4-4. LIAISON RADIO (AN/ARC-8). The liaison radio receiver, transmitter and controls for the fixed and trailing antenna are at the radio-operator's station, *figure 4-3*, and a remote-transmitter control switch is on the pilots' radio-control panel, *figure 1-6*. The receiver can be tuned to any frequency in six bands from 200 to 500 kilocycles and from 1.5 to 18.0 megacycles. The transmitter is pretuned to eleven frequency channels selected either remotely by a switch on the pilots'

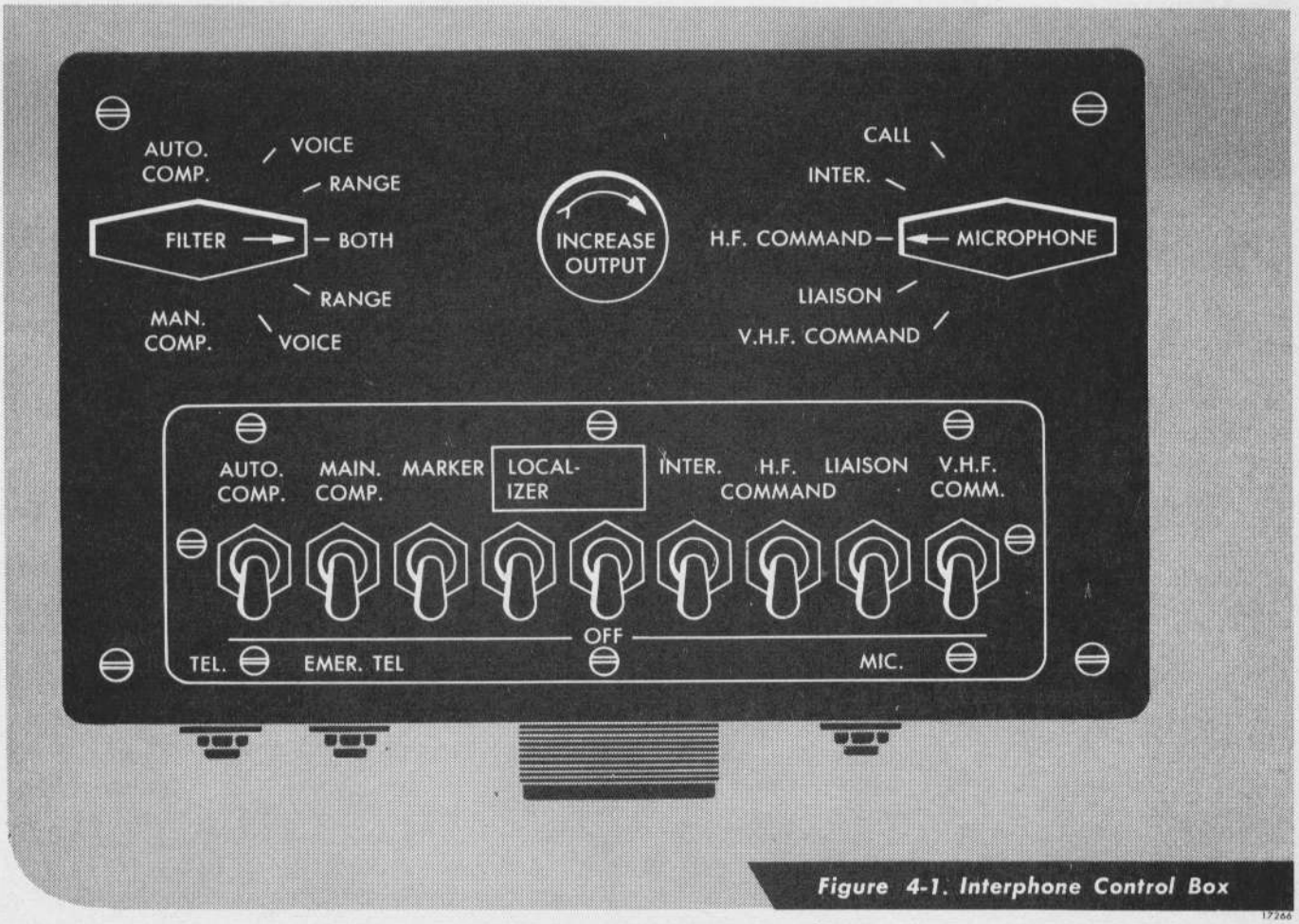


Figure 4-1. Interphone Control Box

17266

radio-control panel or by a similar switch at the transmitter, depending on the position of the "REMOTE-LOCAL" switch on the transmitter. Ten frequency channels range from 2000 to 18,000 kilocycles and one channel, identified "LF," is from 200 to 1500 kilocycles.

4-5. HF COMMAND RADIO (AN/ARC-9). The 50-watt HF command radio operates on ten fixed-frequency crystal-controlled channels listed below.

Channel	*Frequency (Kilocycles)*
1	3105.0
2	4220.0
3	4495.0
4	4575.0
5	4465.0
6	5588.0
7	5662.0
8	6210.0
9	6440.0
10	6500.0

The receiver-transmitter at the radio-operator's station may be remotely controlled at the pilot's radio-control panel.

4-6. VHF COMMAND RADIO (AN/ARC-3). The 8-watt VHF command radio operates in a frequency range of 100 to 156 megacycles. Eight frequency channels, identified "A" to "H," are selected by a switch on the pilots' radio-control panel. The receiver, transmitter, and power junction box are at the radio-operator's station. This equipment is relatively free from static and will operate under extreme temperature and humidity conditions.

4-7. IFF RADIO (SCR-695). The IFF radio automatically identifies the airplane to any challenging station by means of one of six codes. The radio will also transmit a distress signal. Switches on the radio-operator's control panel turn the radio "ON" or "OFF," select the desired identification code, and turn the distress signal "ON" when required. The receiver-transmitter is in the lower nose compartment.

4-8. STATIC DISCHARGERS. Twelve AN/ASA-3 static dischargers are on this airplane. Three are on each wing trailing edge, near the wing tip, and two each on the trailing edges of the vertical and horizontal stabilizer tips. The purpose of the dischargers is to conduct precipitation static in a continuous flow from the airplane into the atmosphere.

4-9. MANUAL RADIO COMPASS (AN/ARN-11). The manual radio compass provides simultaneous visual and audible indication of the direction of radio signals relative to the airplane. The frequency ranges are from 200 to 400 kilocycles and from 550 to 1200 kilocycles. The set will also receive audible nondirectional radio signals in frequency ranges from 200 to 410 kilocycles, from 550 to 1200 kilocycles and from 2.9 to 6.0 megacycles. The pilot and copilot each have a manual radio compass left-right indicator on their instrument panel which provides visual indication of the general direction of the transmitting station. The controls for the manual radio-compass indicator and loop are on the pilots' compass panel and the controls for tuning the receiver are on the pilots' radio-control panel. The controls are colored red for easy identification.

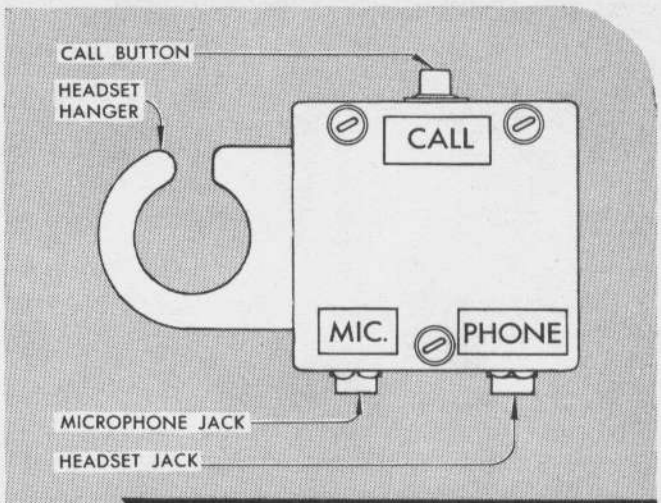


Figure 4-2. Interphone Call Box

4-10. AUTOMATIC RADIO COMPASS (AN/ARN-7). The automatic radio compass provides automatic visual bearing indications and aural reception of radio signals. The receiver covers a frequency range of 100 to 1750 kilocycles in four bands. The unit may be used for navigation, radio range, weather broadcasts and other low-frequency reception.

4-11. Two sets of controls, one set on the pilots' radio-control panel and the other set on the navigator's auxiliary panel, are provided to allow operation from either the pilots' or navigator's stations. Only one set of controls can be used at a time, but control may be easily switched from one operator's station to the other. The controls are colored green for easy identification. Automatic-compass indicators are located on the pilots' instrument panel and the navigator's instrument panel.

4-12. RADIO ALTIMETER (SCR-718). The radio altimeter is used for determining the altitude of the airplane above the ground up to 40,000 feet. The receiver and transmitter are in the lower nose compartment and the altitude indicator is above the navigator's table. Provisions for installation of a radio altimeter AN/APN-1 have been made in this airplane. The indicator, limit switch and three indicator lights may be installed in the space on the pilots' instrument panel.

4-13. LORAN RADIO (AN/APN-9). The AN/APN-9 Loran radio receives, amplifies, and detects signals transmitted on the Loran principle and displays them on the screen of a cathode-ray indicator tube in the receiver indicator at the navigator's station. The radio will operate at any altitude up to 40,000 feet and at a

range of 700 miles during the day and 1200 miles at night.

4-14. MARKER-BEACON RADIO (RC-193). The airplane is equipped with conventional marker-beacon radio. The receiver is in the lower forward cargo compartment, the "OFF-LOW-HIGH" switch is on the pilots' radio-control panel and an indicator light is on the pilots' instrument panel.

4-15. BLIND-LANDING RADIOS. The RC-103A localizer radio provides lateral guidance and the AN/ARN-5 glide-path radio provides vertical guidance. The signals from both radios are fed into two blind-landing indicators on the pilots' instrument panel, one for the pilot and one for the copilot. Both indicators give visual indication of the airplane's lateral position relative to the runway and its vertical position relative to the glide-path beam. A switch on the pilots' radio-control panel turns both receivers "ON" and selects one of six frequencies ranging from 108.3 to 110.3 megacycles and labeled "U" to "Z." Audible reception is available through the interphone system. Volume control of the aural reception is controlled by a screwdriver-adjusted potentiometer in the radio junction box. Both receivers are on the radio rack at the radio-operator's station.

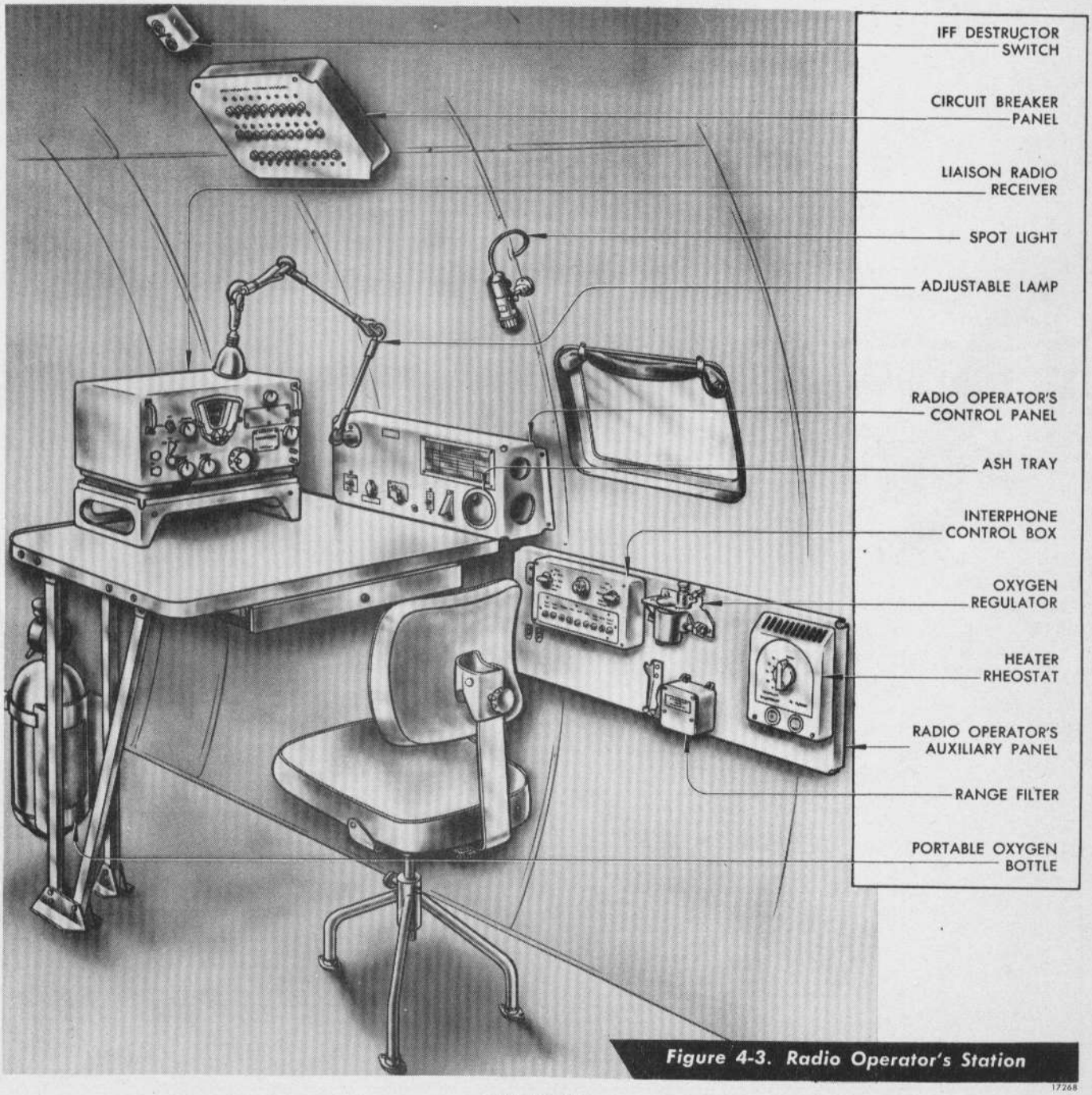
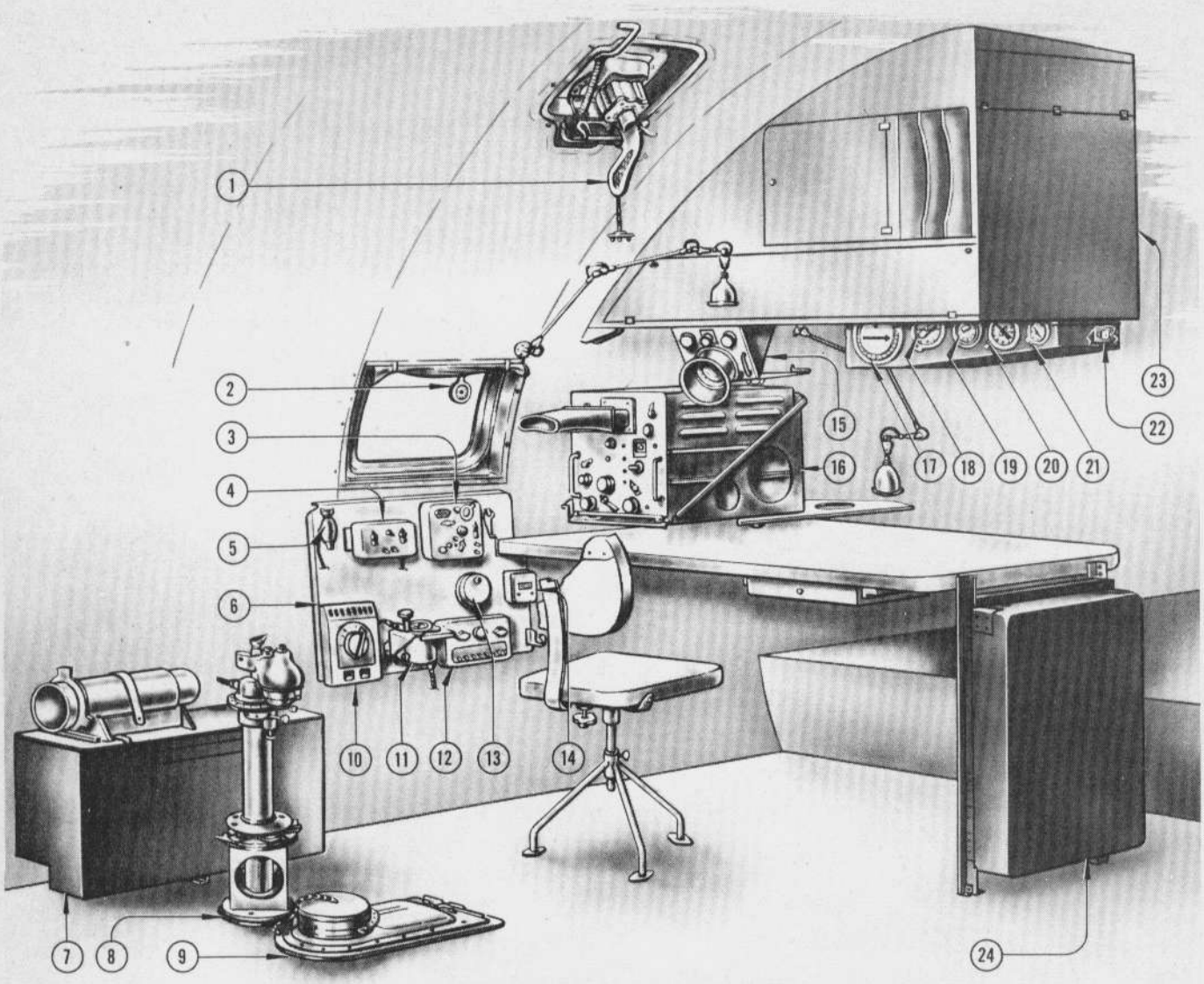


Figure 4-3. Radio Operator's Station

17268



LEGEND

1. SIGNAL PISTOL
2. OUTSIDE AIR TEMPERATURE INDICATOR
3. RADIO COMPASS CONTROL BOX
4. SWITCH PANEL
5. SPOT LIGHT
6. NAVIGATOR'S AUXILIARY PANEL
7. DRIFT SIGNAL AND FLARE CABINET
8. DRIFTMETER
9. FLARE RELEASE CHUTE
10. HEATER RHEOSTAT
11. OXYGEN REGULATOR
12. INTERPHONE CONTROL BOX
13. ASH TRAY
14. RANGE FILTER
15. RADIO ALTIMETER INDICATOR
16. LORAN RADIO RECEIVER
17. AUTOMATIC RADIO COMPASS INDICATOR
18. MAGNETIC COMPASS REMOTE INDICATOR
19. AIRSPEED INDICATOR
20. BAROMETRIC ALTIMETER
21. CLOCK
22. CABIN AIR TEMPERATURE INDICATOR
23. CHART CABINET
24. FOLDING TABLE EXTENSION

Figure 4-4. Navigator's Station

17269

4-16. CABIN-PRESSURIZING SYSTEM.

4-17. The entire fuselage is pressurized forward of the pressure bulkhead in the tail, except for the nose landing-gear well. The air for pressurization is supplied by the inboard turbosuperchargers on the inboard engines. The pressure in the airplane remains approximately the same as atmospheric pressure from sea level to 8000 feet. From 8000 to 30,000 feet the pressurizing system maintains a cabin-air pressure equivalent to approximately 8000 feet (22.2 inches Hg). Above 30,000 feet the system keeps the pressure inside the airplane approximately 13.3 inches Hg higher than the surrounding atmospheric pressure.

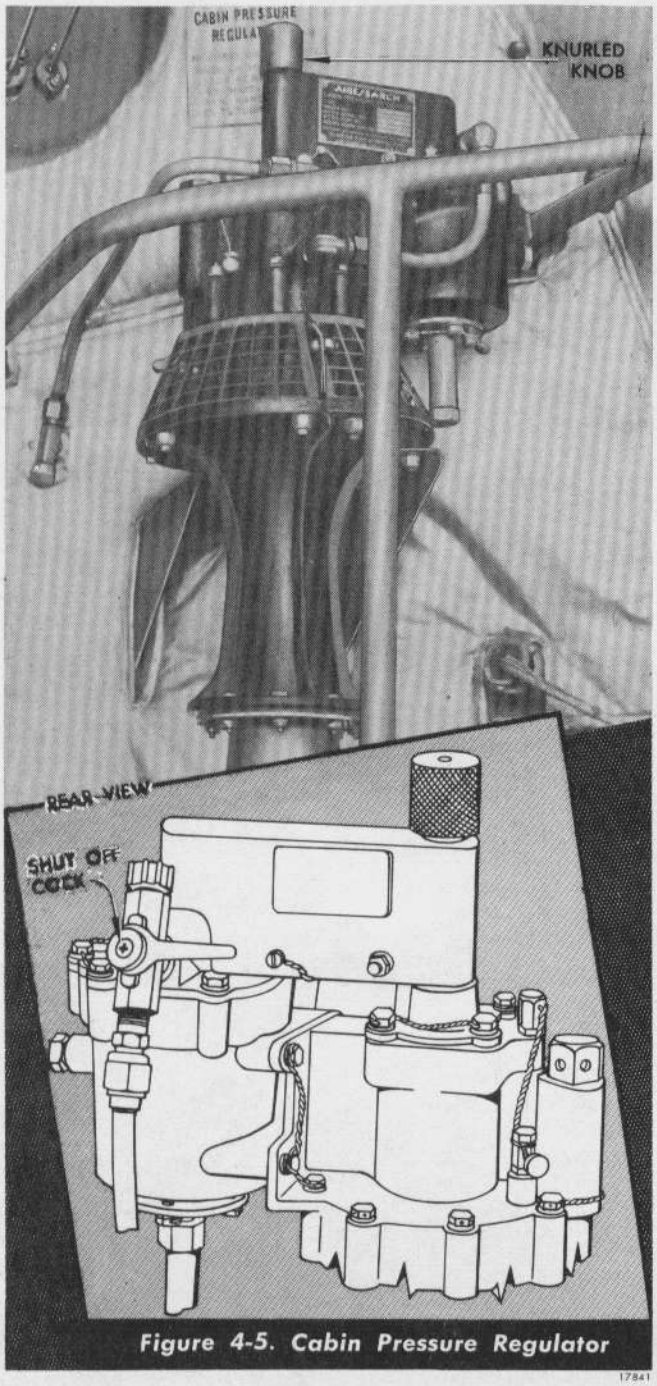


Figure 4-5. Cabin Pressure Regulator

17841

4-18. The temperature of this pressurized air is regulated for cabin heating, cabin ventilating, and cabin-window defrosting and deicing. The air circulates through the cabin and is then released through two identical cabin-pressure regulators. The pressure regulators are in the rear of the main cargo compartment and maintain the desired pressure by controlling the rate of discharged air. The discharged air passes into the unpressurized tail compartment. During normal operation, both regulators are operative; in the event that one of the regulators fails to function, the remaining regulator alone is capable of maintaining the required cabin-air pressure. For normal operation, screw out the knurled knob on top of each regulator and open the shutoff cock (handle parallel to tubing).

4-19. Two cabin-airflow indicators are on the left side of the pilots' instrument panel. A cabin-pressure altimeter above them indicates the inside air pressure in feet.

4-20. CABIN-AIR CHECK VALVES. The left and right cabin-heat ducts each have a cabin-air check valve, where the duct enters the fuselage. These valves automatically seal the ducts should upstream pressure become less than cabin pressure. This assures cabin pressure in case of engine or upstream duct failure. If the pressure system on one side fails, the other system will provide sufficient pressure. The valves can also be closed manually by two "EMERGENCY CABIN AIR" levers at the base of the engine control stand. Normally the valves are open; in case of an engine or nacelle fire, close the valve for the affected wing system.

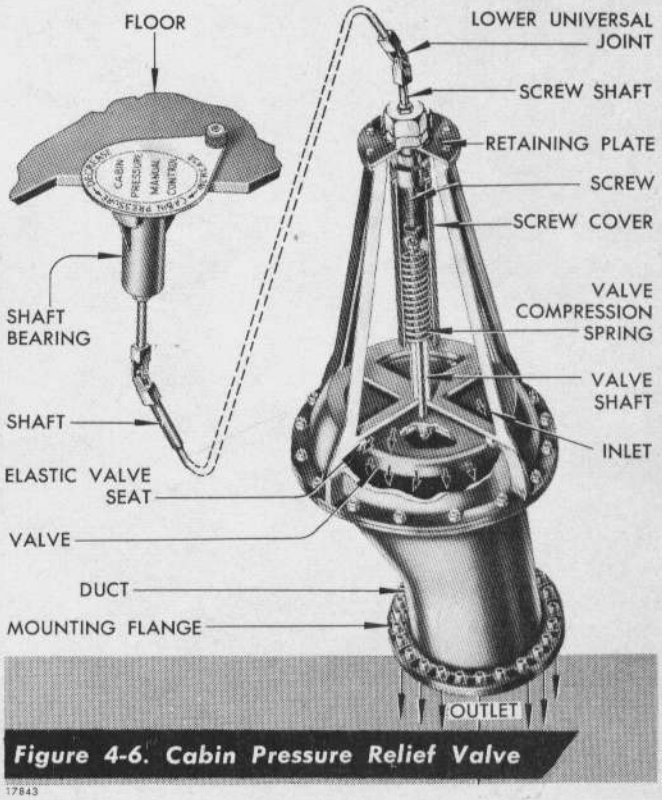


Figure 4-6. Cabin Pressure Relief Valve

17843

4-21. CABIN-PRESSURE REGULATORS. In the event cabin pressure does not remain within the pressurized limits, check the two cabin-pressure regulators. To check a regulator, turn off the other regulator by screwing down the knurled knob on top of the regulator. Then close the shutoff cock. Check one regulator at a time. If either regulator is faulty, leave it turned off. If both regulators are normal, use the cabin-air pressure check list to determine if there is a leak at any of the outlets. If both regulators are faulty, turn both of them off and control the pressure with the cabin-pressure relief valve.

4-22. CABIN-PRESSURE RELIEF VALVE. The cabin-pressure relief valve is in the lower nose compartment and can be controlled manually by a crank which is folded into a plate-covered well to the right of the engineer. During normal operation, this valve remains closed. If the cabin-pressure regulators should fail the relief valve will automatically relieve at 14 inches Hg differential pressure. Cabin pressure can be manually regulated or decreased slowly, by turning the control crank for the valve.

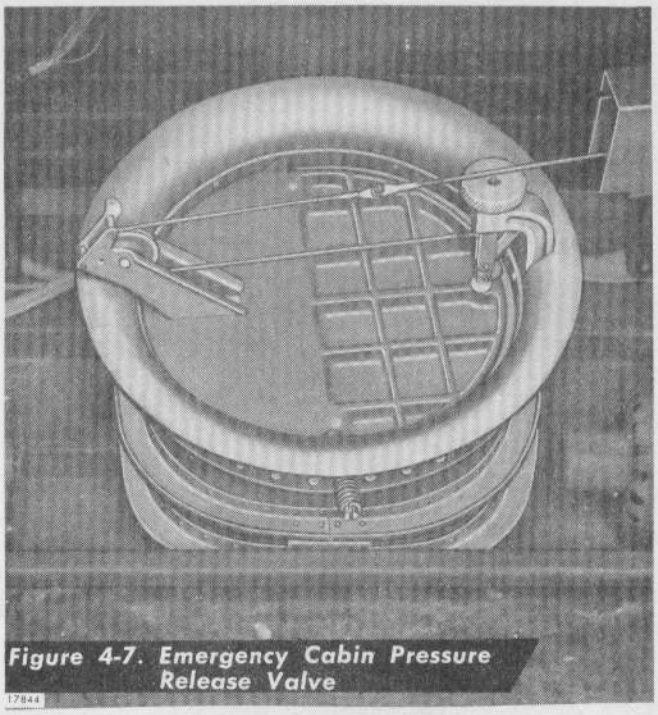


Figure 4-7. Emergency Cabin Pressure Release Valve

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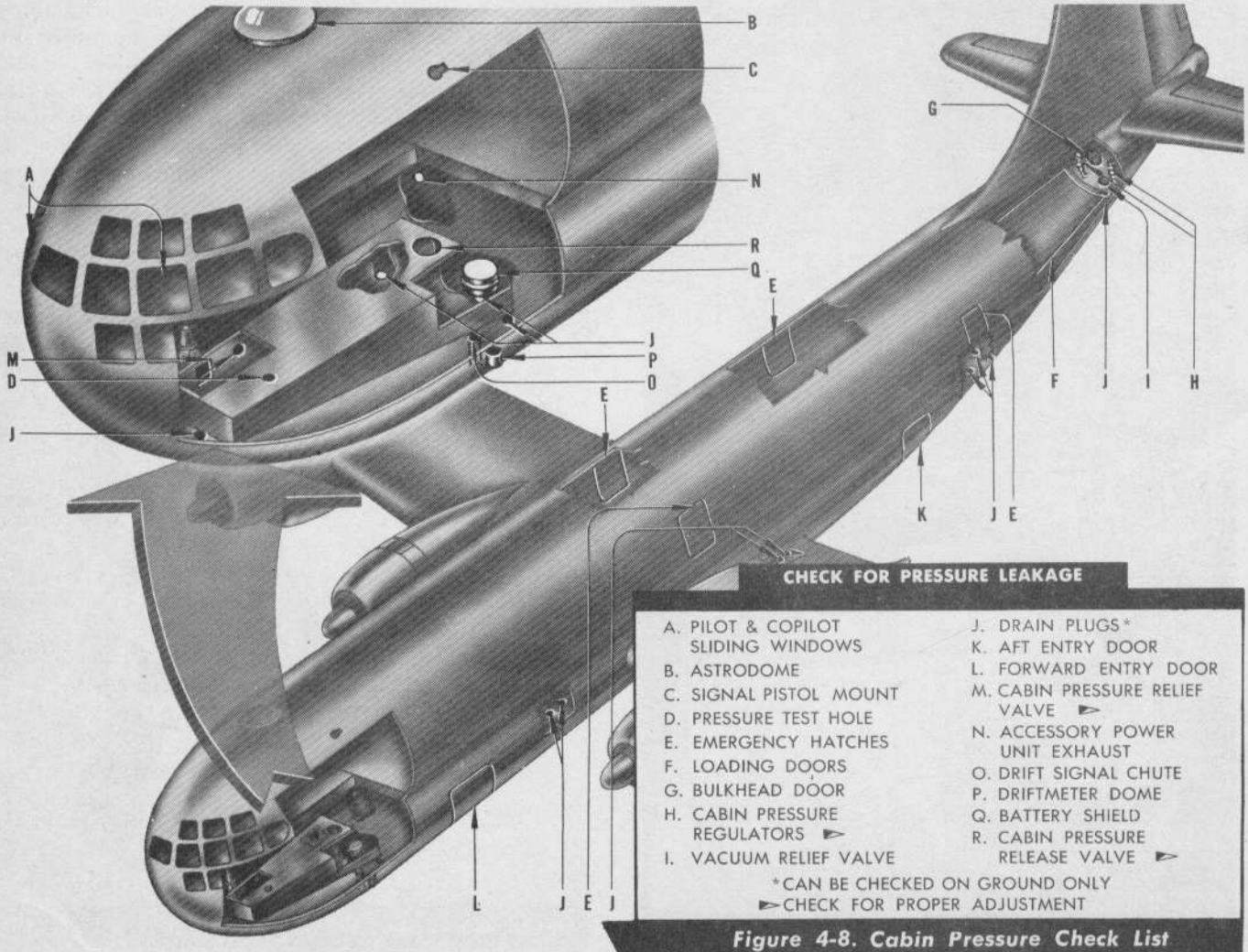

CHECK FOR PRESSURE LEAKAGE

A. PILOT & COPILOT SLIDING WINDOWS
B. ASTRODOME
C. SIGNAL PISTOL MOUNT
D. PRESSURE TEST HOLE
E. EMERGENCY HATCHES
F. LOADING DOORS
G. BULKHEAD DOOR
H. CABIN PRESSURE REGULATORS ►
I. VACUUM RELIEF VALVE
J. DRAIN PLUGS*
K. AFT ENTRY DOOR
L. FORWARD ENTRY DOOR
M. CABIN PRESSURE RELIEF VALVE ►
N. ACCESSORY POWER UNIT EXHAUST
O. DRIFT SIGNAL CHUTE
P. DRIFTMETER DOME
Q. BATTERY SHIELD
R. CABIN PRESSURE RELEASE VALVE ►

*CAN BE CHECKED ON GROUND ONLY
►CHECK FOR PROPER ADJUSTMENT

Figure 4-8. Cabin Pressure Check List

17842

4-23. CABIN-VACUUM RELIEF VALVE. This automatic-operating valve, which protects the fuselage against negative pressure, is in the rear of the main cargo compartment. The valve opens inward whenever atmospheric is greater than cabin pressure.

4-24. EMERGENCY CABIN-PRESSURE RELEASE. The emergency cabin-pressure release valve in the lower nose compartment, cable controlled from a handle on the engine control stand, is provided to release cabin pressure in an emergency. A pull on the handle will open the valve and allow air to escape through the unpressurized nose landing-gear well. After operating, the handle will come back to place, but the emergency pressure-release valve will have to be reset and latched manually. Oxygen equipment should always be in readiness in the event depressurization is necessary.

4-25. CABIN-PRESSURE WARNING HORN AND WARNING LIGHT. A horn above the pilot gives an intermittent warning signal when cabin-air pressure falls below 19 inches Hg (12,000 feet cabin altitude). With the cabin-pressure warning switch off, the horn will not blow and an adjacent warning light will glow as a reminder that the horn is inoperative.

4-26. CABIN HEATING AND VENTILATING SYSTEM.

4-27. The cabin heating and ventilating system is actually two systems. The left system normally supplies the air and controls the temperature of the air flowing to the control cabin and the right system supplies the air and controls the temperature of the air flowing to the cargo compartments. However, if one system should fail the airflow may be changed through valves in the air-distribution manifold.

The same air that is used for cabin pressurization is used for heating and ventilating when the airplane is in flight. Air for ground heating and ventilating is supplied by an electrically-driven ground blower in each inlet duct. The ground blowers operate only when the airplane is on the ground and the "CABIN HEAT" switch is turned "ON." A safety switch on each main landing gear prevents the operation of its ground blower when the weight of the airplane is not on the landing gear. Each heating system has an aftercooler and a combustion heater. The aftercooler controls the temperature of the pressurized air flowing from the turbosuperchargers to the cabin, and when necessary, the combustion heater furnishes additional heat.

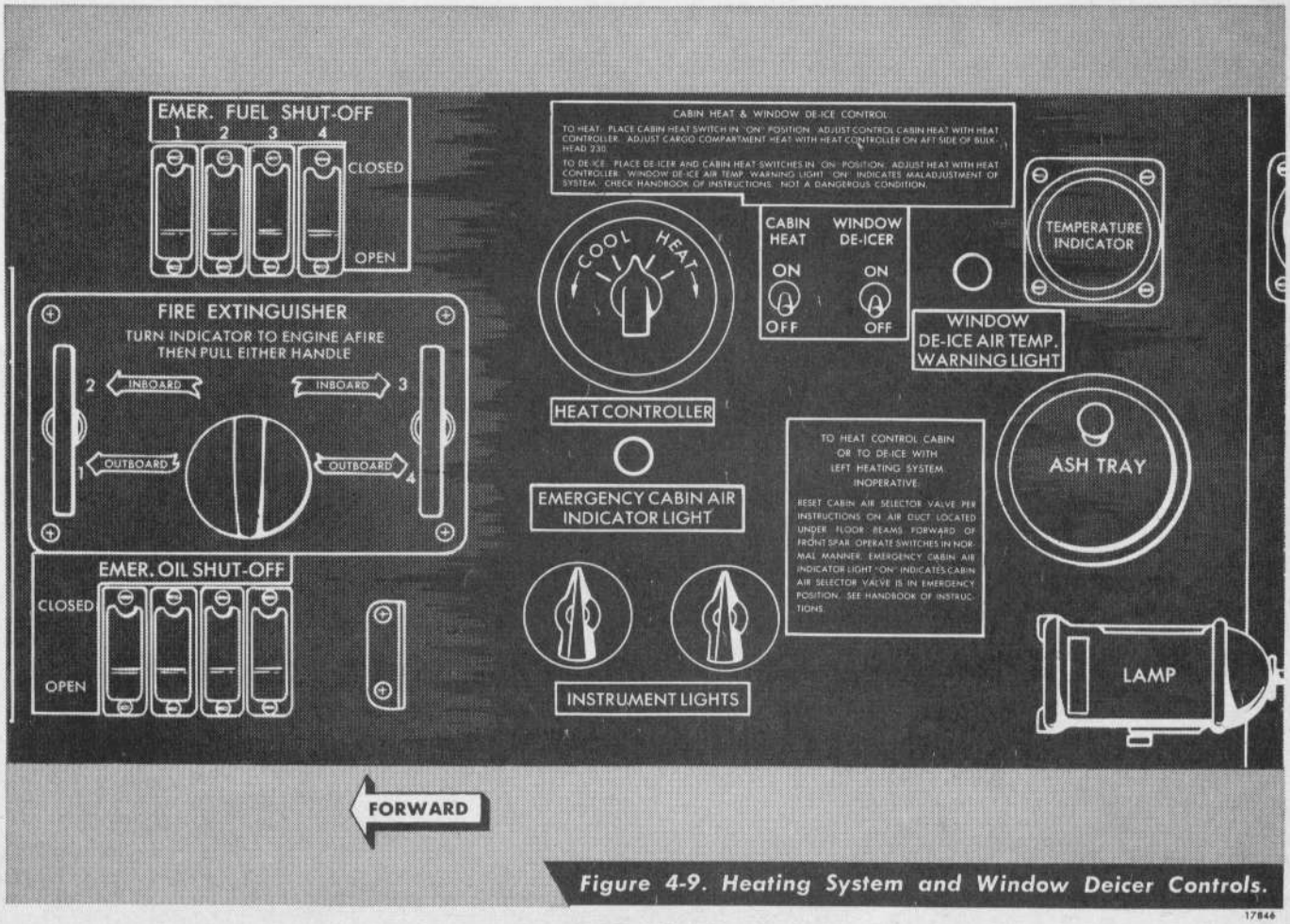

Figure 4-9. Heating System and Window Deicer Controls.

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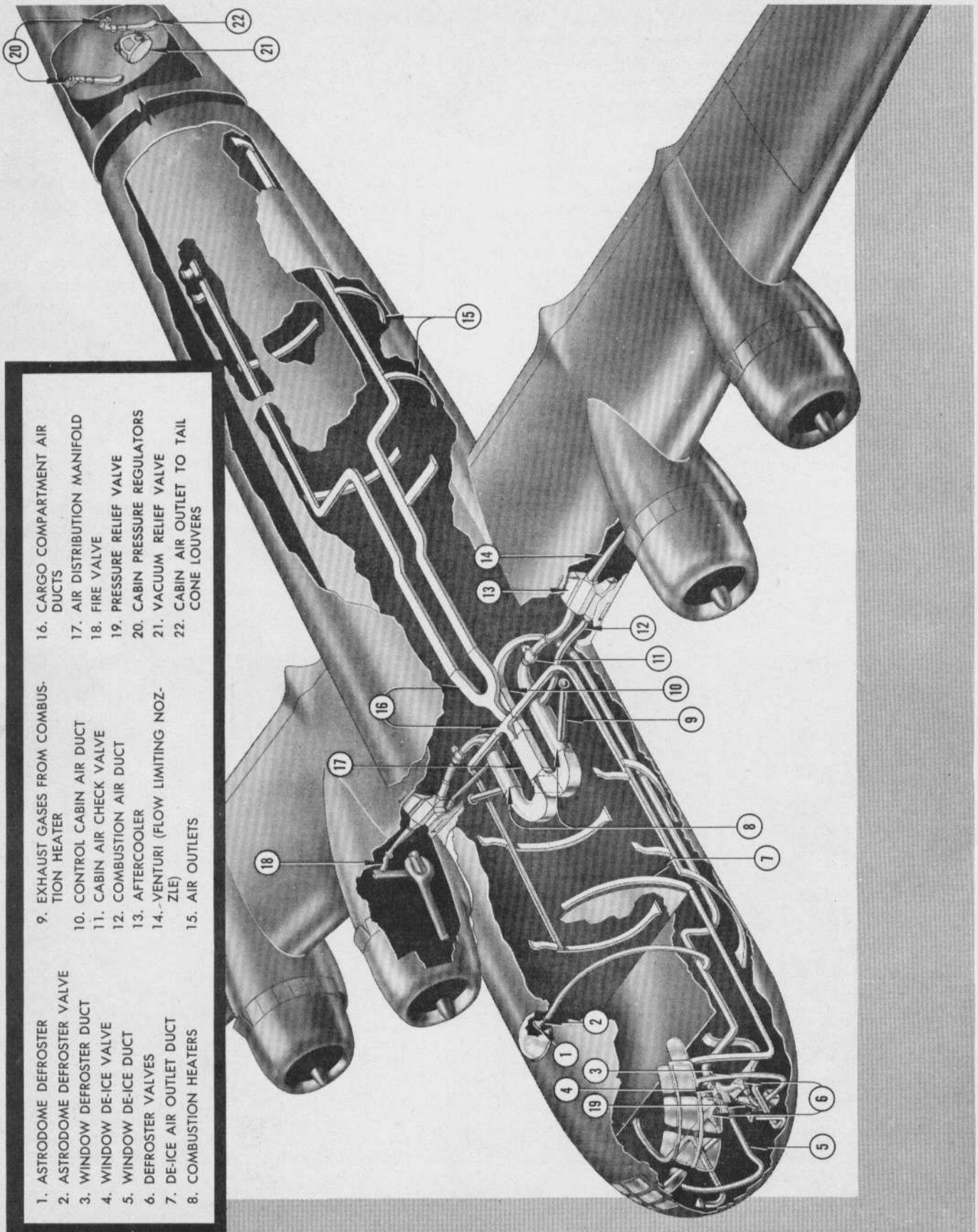


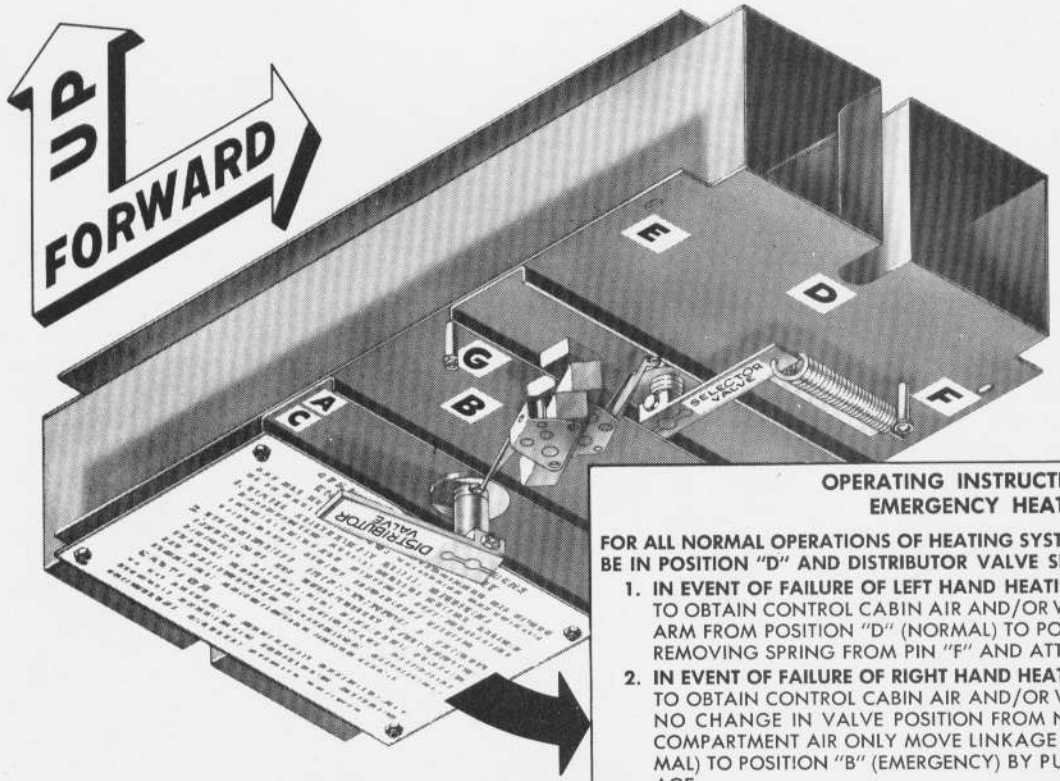
Figure 4-10. Cabin Pressurizing, Heating and Ventilating Systems

17845

4-28. CABIN HEATING - SYSTEM OPERATION. The heating units of each system are automatically controlled. Both heating systems are turned on by a single "CABIN HEAT" switch on the copilot's auxiliary panel. Temperature of the air flowing to the control cabin is regulated by adjustment of the "HEAT CONTROLLER" on the copilot's auxiliary panel. Temperature of the air flowing to the cargo compartments is regulated by adjustment of the "HEAT CONTROLLER" in the forward part of the main cargo compartment; except that in an emergency when air from the left system is directed to the cargo compartments, its temperature is regulated by the "HEAT CONTROLLER" on the copilot's auxiliary panel. A thermometer on the forward side of the navigator's instrument panel registers control-cabin temperature. A remote-temperature indicator on the copilot's auxiliary panel registers cargo-compartment temperature.

Figure 4-11. Cargo Compartment Heat Control

4-29. OPERATION OF CABIN-HEATING AIR-DISTRIBUTION MANIFOLD. The air-distribution manifold is located overhead in the rear part of the lower forward cargo compartment. A selector valve and a distributor valve in the unit direct the flow of air. Normally air from the left system is directed to the control cabin and to the window deicer and air from



OPERATING INSTRUCTIONS
EMERGENCY HEAT

FOR ALL NORMAL OPERATIONS OF HEATING SYSTEM SELECTOR VALVE SHOULD BE IN POSITION "D" AND DISTRIBUTOR VALVE SHOULD BE IN POSITION "A".

1. **IN EVENT OF FAILURE OF LEFT HAND HEATING SOURCE:**
   TO OBTAIN CONTROL CABIN AIR AND/OR WINDOW DE-ICING AIR, MOVE ARM FROM POSITION "D" (NORMAL) TO POSITION "E", (EMERGENCY) BY REMOVING SPRING FROM PIN "F" AND ATTACHING TO PIN "G".
2. **IN EVENT OF FAILURE OF RIGHT HAND HEATING SOURCE:**
   TO OBTAIN CONTROL CABIN AIR AND/OR WINDOW DE-ICING AIR, MAKE NO CHANGE IN VALVE POSITION FROM NORMAL. TO OBTAIN CARGO COMPARTMENT AIR ONLY MOVE LINKAGE FROM POSITION "A" (NORMAL) TO POSITION "B" (EMERGENCY) BY PUSHING FORWARD ON LINKAGE.

CAUTION:
DO NOT ATTEMPT TO MOVE LINKAGE MANUALLY BETWEEN "A" AND "C". CHANGE IN VALVE LINKAGE FROM POSITION "A" (NORMAL) TO POSITION "C" (DE-ICING) OR FROM "C" TO "A" IS ACCOMPLISHED BY DE-ICER SWITCH IN CABIN CONTROL.

Figure 4-12. Air Distribution Manifold Control

the right system is directed to the cargo compartments. However, should either the left or the right system fail, air from the opposite system can be directed to either the control cabin or the cargo compartments in accordance with the positioning of the selector valve and distributor valve. See *figure 4-12* for operating instructions. An amber "EMERGENCY CABIN-AIR INDICATOR" light on the copilot's auxiliary panel will glow when the selector valve is in position "E."

4-30. WINDOW DEICING. Deicing is provided for the double-panel windows in the control cabin. A window deicer switch on the copilot's auxiliary panel controls a deice valve that directs a portion of the heated air between the panes of the windows. Temperature of the air is regulated by adjustment of the control cabin "HEAT CONTROLLER." Two window-deicer safety thermostats are provided to prevent overheating of the windows. One thermostat limits the temperature during flight. The other thermostat, in series with a nose landing-gear ground-heating safety switch, limits the temperature when the airplane is on the ground.

4-31. The amber "window-deice air-temperature warning light" glows on the copilot's auxiliary panel whenever the safety thermostats turn off the heating system. As soon as the heating system comes on again the light goes out. Continuation of this cycle indicates malfunction of the built-in temperature limitations and also indicates that the temperature is being safely controlled by the thermostats. If the warning light glows continuously for several minutes or more, decrease the setting of the control-cabin "HEAT CONTROLLER." Turn the window-deicer switch "OFF" whenever window deicing is not needed.

4-32. WINDOW DEFROSTING. Two defrosting valves, one on each side of the control cabin, distribute the heated air to the cabin-heat vents, or to outlets that direct the heated air over the control cabin windows. The control knob for the left defrost valve is on the pilot's auxiliary panel; the control knob for the right defrost valve is on the copilot's auxiliary panel. When the defrost valves are turned full on, all the air flow is directed over the windows. The control knob can be adjusted to direct any portion of the air to the window-defrost outlets or to the cabin-heat vents. The astrodome can be deiced or defrosted by adjusting an ejector nozzle at the dome. Open the nozzle to deice or defrost, but always keep the nozzle closed when no need for deicing or defrosting exists.

4-33. OXYGEN SYSTEM.

4-34. Two continuous-flow low-pressure oxygen systems and two portable oxygen bottles provide oxygen for the flight crew and airborne troops, when the cabin-pressurizing system fails. One system supplies the crew and the other system furnishes oxygen for the airborne troops. A filler valve in the lower forward cargo compartment charges both systems. A line valve adjacent to the filler valve isolates the troop oxygen system from the crew system. This line valve must be

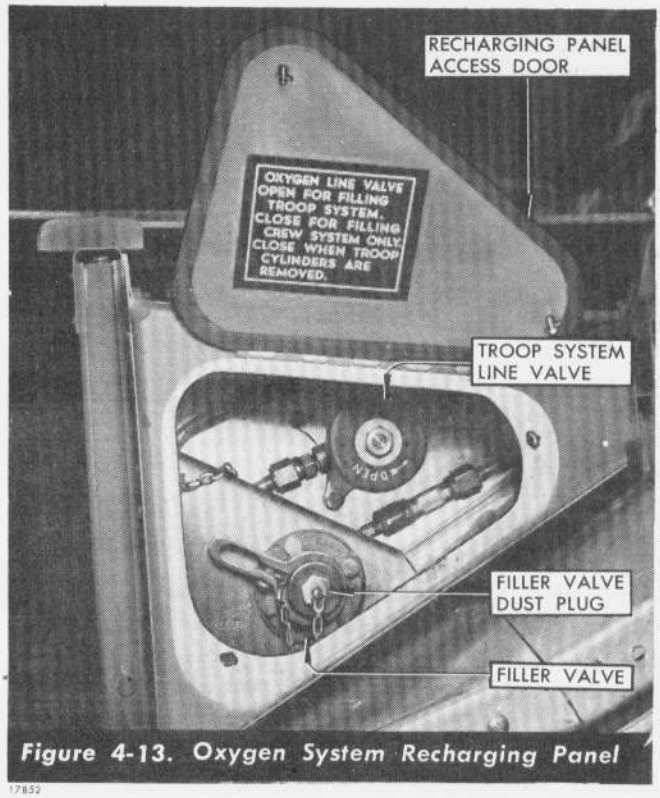


Figure 4-13. Oxygen System Recharging Panel

17852

open to replenish both systems during recharging. The normal position of the line valve is closed, but in the event that the crew-system oxygen supply becomes depleted the line valve is opened and the troop oxygen system supplies the crew system. The oxygen flows from the troop system to the crew system in one direction only, therefore the crew oxygen system cannot furnish oxygen to the troop system. Fill the system to a maximum pressure of 450 PSI. A placard similar to *figure 4-14* is on the navigator's cabinet.

4-35. CREW OXYGEN SYSTEM. The oxygen for the flight crew is contained in two G-1 cylinders in the lower nose compartment. One cylinder supplies oxygen to the navigator, the pilot, and the engineer. The other cylinder supplies oxygen to the copilot and the radio operator. Provisions are made for a third G-1 cylinder which, when installed, supplements the supply of both the regular cylinders. An A-9A oxygen regulator is on each crew member's auxiliary panel. The regulators, recharging valves and flow diagram are shown in *figure 4-14*.

4-36. TROOP OXYGEN SYSTEM. The oxygen for airborne troops is stored in one large J-1 and three G-1 cylinders. The large cylinder is in the lower nose compartment and the three G-1 cylinders are in the rear stowage compartment. Provisions are made for three additional G-1 and one J-1 cylinder in the rear stowage compartment to double the oxygen capacity of the troop system. Automatic-coupling type oxygen outlets are available in each compartment. Oxygen flow to the outlets is controlled by automatic continuous-flow type

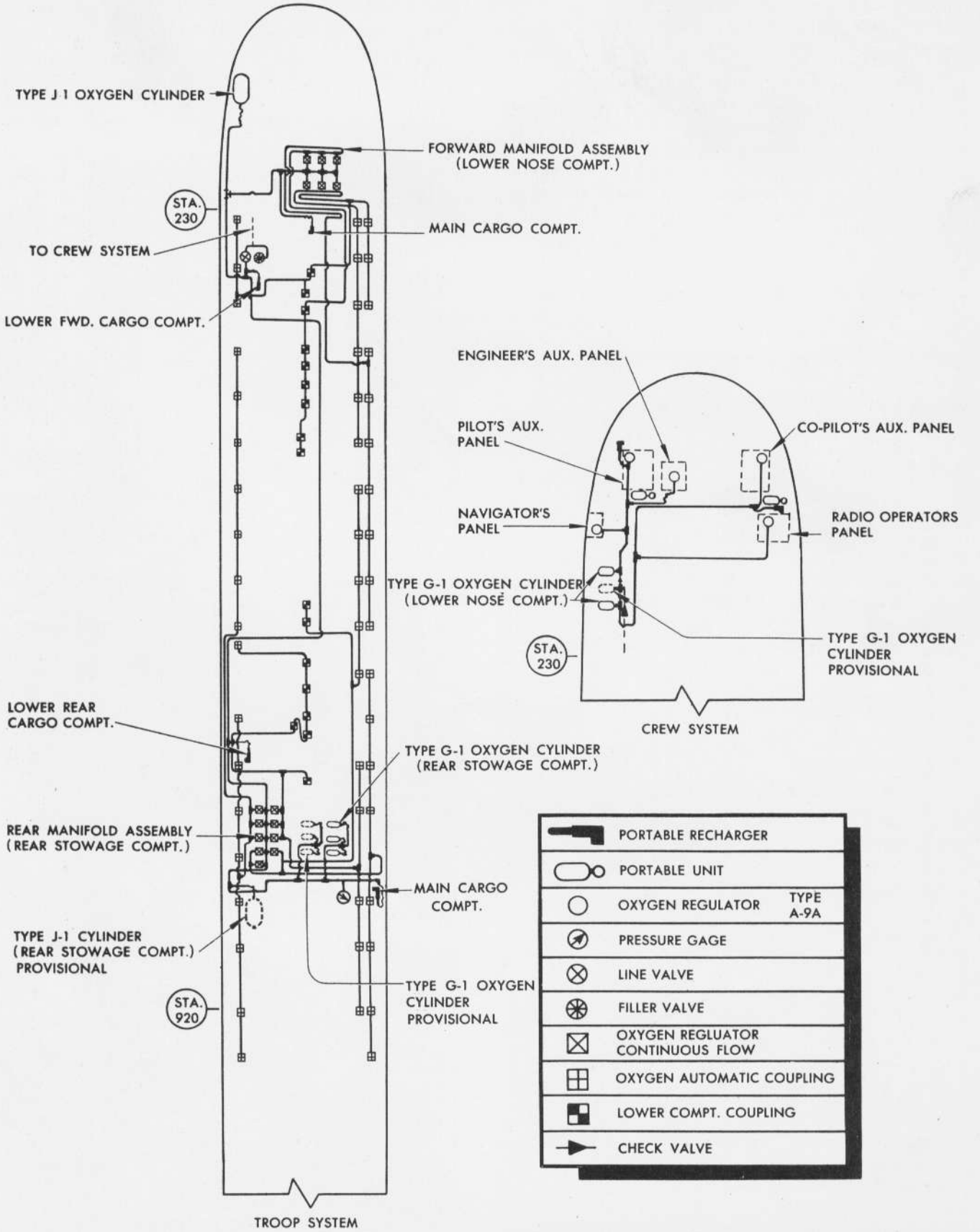


Figure 4-14. Oxygen Flow Diagram

17941

regulators. A gage on the right side, in the aft part of the main cargo compartment, indicates the pressure in the system.

4-37. PORTABLE OXYGEN BOTTLES. The two portable oxygen bottles in the control cabin are used by crew members when moving about the airplane. Recharger fittings for the portable bottles are at the pilot's and copilot's stations, at the forward and aft ends of the main cargo compartment, and in the lower forward and lower rear cargo compartments.

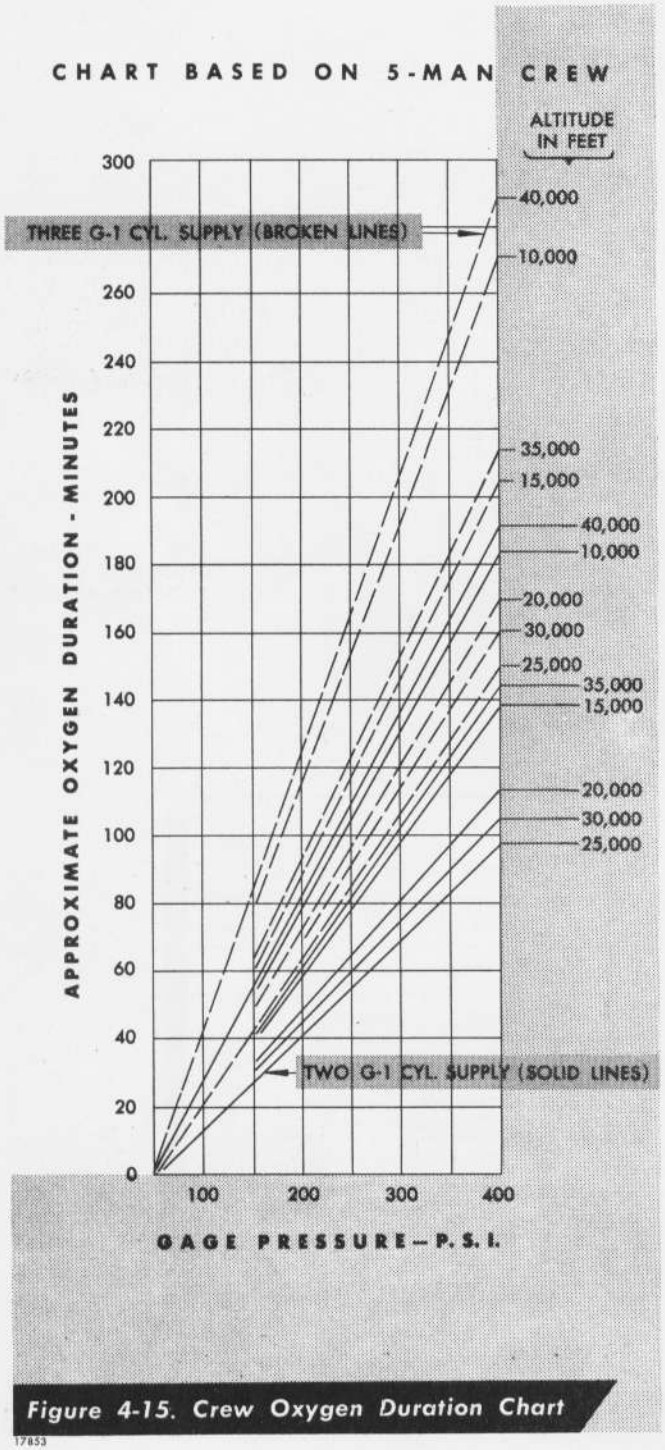


Figure 4-15. Crew Oxygen Duration Chart

17853

4-38. CARGO-CARRYING EQUIPMENT.

4-39. This airplane will carry up to 41,000 pounds of cargo. Most of the cargo is carried in the main cargo compartment; however, cargo can also be carried in the lower forward and lower rear cargo compartments. The main cargo compartment is loaded through the

Figure 4-16. Cargo Hoist Portable Control Unit

12341

Figure 4-17. Cargo Hoisting Hook, Trolley, and Snatch Block

17542

main cargo-loading doors at the rear of the compartment. The lower forward and lower rear cargo compartments are loaded through the forward and rear entrance doors in the left side of the fuselage or through the forward and rear cargo hatches in the floor of the main cargo compartment.

Two propellers can be carried externally on the bottom of the fuselage.

4-40. CARGO-HOISTING EQUIPMENT. An electric hoist, at the forward end of the main cargo compartment, operates a hoisting hook, which is suspended from a trolley that can travel forward and aft on an overhead rail. The cargo-hoisting equipment is used to hoist cargo from the ground, through the main cargo-loading door opening, to move the cargo forward or aft in the compartment, and to lower the cargo into position. The hoisting equipment is also used to pull rolling equipment up the cargo ramps and forward into the main cargo compartment.

4-41. The cargo-hoisting equipment is designed to lift 5000 pounds, using a snatch block, or 2500 pounds, using the hoisting hook, *figure 4-17*. Operating instructions are posted on the walls of the main cargo compartment and control cabin.

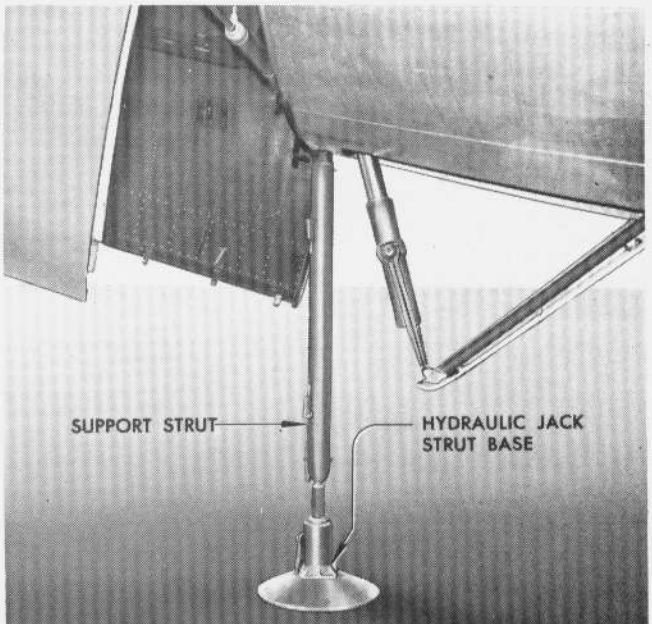


Figure 4-18. Cargo Loading Support Strut

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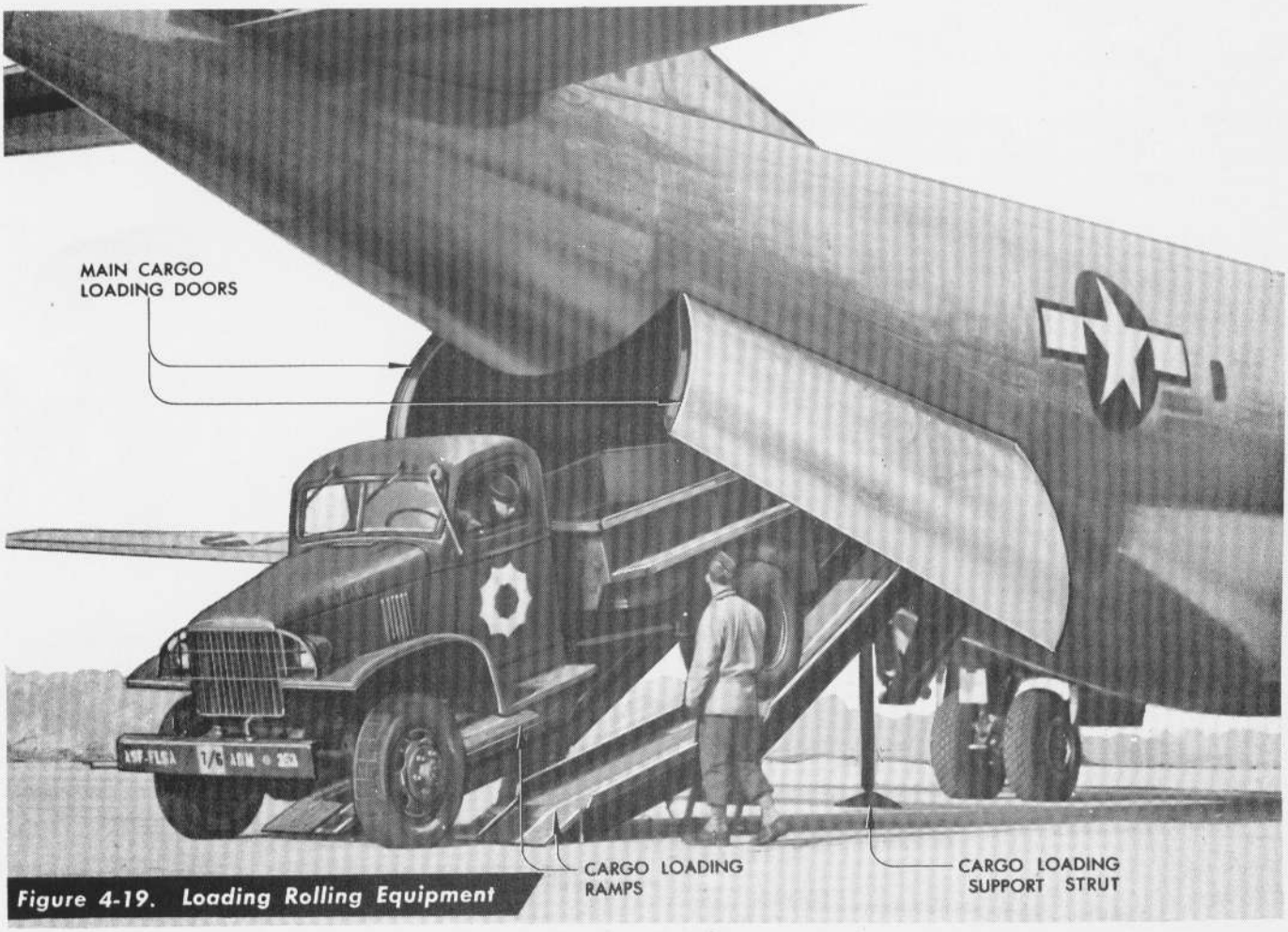


Figure 4-19. Loading Rolling Equipment

17544

4-42. A portable control unit, to operate the electric hoist, is held in the operator's hand. There are five push buttons on the portable control unit: "UP," "DOWN," "FORWARD," "AFT," and "EMERGENCY STOP," *figure 4-16.* Three plug-in receptacles for the control unit, along the right side of the main cargo compartment, enable the operator to control the loading and unloading of cargo from the most advantageous position.

4-43. MAIN CARGO-LOADING DOORS. The main cargo-loading doors at the rear of the main cargo compartment are opened and closed by an independent hydraulic system. See "Hydraulic System," section I, paragraph 1-70, "Cargo-Door System Control."

4-44. CARGO-LOADING SUPPORT STRUT. The cargo-loading support strut is for supporting the fuselage at the tail-skid jacking pad when loading cargo, *figure 4-18.* The jack-strut base is stowed in the rear stowage compartment and the support strut is stowed on the floor at the rear end of the lower rear cargo compartment. The support strut should be used as a support only, and when used with other jacks, it should always be raised last and lowered first.

4-45. CARGO-LOADING RAMPS. There are two cargo-loading ramps, *figure 4-19,* which lower through the main cargo-loading door opening and provide a ramp from the ground to the floor of the compartment. The two ramps are adjustable laterally to accommodate rolling equipment with different treads. The support in the center of the ramp is also adjustable and will provide either a constant 24-degree slope, or a 15-degree slope of the lower part of the ramp and a 30-degree slope of the upper part of the ramp to accommodate rolling equipment requiring large vertical clearance.

4-46. LOWERING AND RAISING CARGO RAMPS. The cargo-loading ramps are lowered with the cargo-hoisting equipment as follows:

a. Raise the hoisting hook up to the trolley.

b. Connect the ramp hoisting cables, on the inboard side of each ramp, to the hoisting hook.

c. Traverse the trolley forward until the large ramp support springs are compressed.

d. Pull the ramp release handles which release the ramps from their stowage hooks.

e. Traverse the trolley to the rear until it comes to the end of the overhead rail.

f. Lower the hoisting hook until the ramps are on the ground.

4-47. The cargo-loading ramps are raised by moving them together to the limit of their adjustment and reversing the above procedure. They will automatically latch in the stowed position.

4-48. REMOVING AND INSTALLING CARGO RAMPS. The cargo ramps are removed as follows:

a. Lower the ramps to the ground.

b. Move the ramps apart to the limit of their adjustment.

c. Attach the hoist hook to the ring located in the center of the upper section of either ramp.

CARGO HOIST OPERATING INSTRUCTIONS

The cargo hoist is normally operated electrically as follows:

a. Start the accessory power plant or connect an external power supply.

b. Connect the portable push button control unit to one of the three plug receptacles along the right side of the main cargo compartment.

c. Turn the power switch and circuit breaker switch on the cargo hoist shield "ON."

d. Run the hoisting hook up or down from the trolley by pushing the "UP" or "DOWN" buttons on the portable control unit or traverse the trolley forward or aft on the overhead rail by pushing the "FORWARD" or "AFT" buttons on the portable control unit.

e. If the "EMERGENCY STOP" button on the portable control unit is pushed the power switch on the cargo hoist shield will be opened and must be returned to "ON" before the cargo hoist can be operated.

17545

Manual operation of cargo hoist is accomplished as follows:

In case power fails and it is necessary to lower a suspended load, simply pull down the brake release arm on the end of hoist motor. Other hand operations (hoisting or traversing) require the following preparations:

Remove winged screw from linkage of clutch actuator on right end of hoist, then disengage arm from hub of short arm that is splined to shaft of actuator motor. Rotate arm 180 degrees keeping roller shaft in slot of arm that is mounted to ball screw. Install wing screw through short slot of arm that has been rotated and into tapped hole in arm of base screw. Operate ball screw by using this arm as a lever and allow roller shaft to pass over ear on end plate and slide lever arm down to hold ball screw in position desired. Rotate clockwise for traversing and counter-clockwise for hoisting or lowering. The hand crank is stowed on the left rear face of the forward bulkhead.

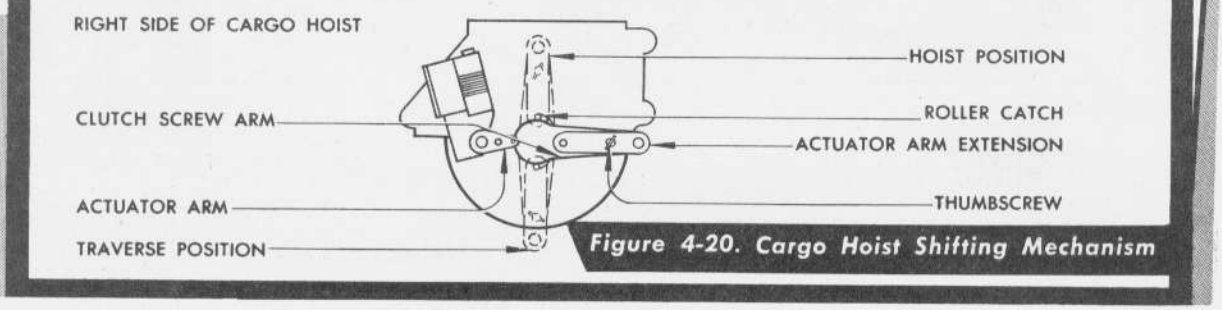


Figure 4-20. Cargo Hoist Shifting Mechanism

d. With the trolley at the rear end of the overhead rail, hoist the ramp off the ground a few inches.

e. Remove the outboard collars from both the inboard and outboard trunnions.

f. While balancing the ramp, slide the hinge rod inboard enough to free the ramp.

g. Lower the ramp to the ground.

h. Repeat steps c through g for the other ramp.

4-49. Install ramps by reversing removal procedure.

4-50. CARGO-LOADING LIMITS. The floor in the main cargo compartment can be loaded up to 200 pounds per square foot. The floor and the seats in the lower forward and lower rear cargo compartments can be loaded up to 100 pounds per square foot. The following charts should be used to determine if a unit of cargo can be loaded through the main cargo-loading doors, the forward or rear entrance doors, or the forward or rear cargo hatches in the floor of the main cargo compartment.

EXPLANATION OF CHARTS

The figures at the top and left of each chart are the cross-section dimensions in inches and the figures in each chart are the length in inches of units of cargo that can be loaded through the various doors and hatches.

EXAMPLE

Can a unit of cargo 12 by 20 by 140 inches be loaded through the forward cargo hatch?
The figure opposite 12 and 20 at the top and left of the Forward Cargo Hatch chart is 152. Therefore, a unit of cargo 12 by 20 by 152 inches can be loaded through the forward cargo hatch and the unit being checked which is only 140 inches can be loaded easily.

CARGO DIMENSION CHARTS

MAIN CARGO LOADING DOORS

	6	12	18	24	30	36	42	48	54	60	66	72	78	84
6	730	730	730	730	730	730	730	730	730	730	730	730	730	730
12	730	730	730	730	730	730	730	730	730	730	730	730	730	730
18	730	730	730	730	730	730	730	730	730	730	730	730	730	730
24	730	730	730	730	730	730	730	730	730	730	730	730	730	730
30	730	730	730	730	730	730	730	730	730	730	730	730	730	730
36	730	730	730	730	730	630	630	620	620	610	594	578	569	545
42	730	730	730	730	730	630	500	495	494	485	472	455	440	350
48	730	730	730	730	730	620	495	408	402	394	382	371	359	263
54	730	730	730	730	730	620	494	402	339	331	323	313	303	206
60	730	730	730	730	730	610	485	394	331	287	280	271	239	157
66	730	730	730	730	730	594	472	382	323	280	245	237	185	123
72	730	730	730	730	730	578	455	371	313	271	237	200	151	100
78	730	730	730	730	730	569	440	359	303	239	185	151	100	
84	730	730	730	730	730	545	350	263	206	157	123	100		
90	730	730	730	730	500	300	196	150	106					
96	730	730	712	270	166	100								

FORWARD ENTRANCE DOOR

	4	8	12	16	20	24	28	32	34
4	214	214	214	214	214	214	210	180	160
8	214	214	214	214	214	214	210	150	135
12	214	214	190	190	180	170	170	130	120
16	214	214	190	140	130	125	120	115	110
20	214	214	180	130	120	115	110	110	105
24	214	214	170	125	115	105	100	95	95
28	210	210	170	120	110	100	94	90	85
32	180	150	130	115	110	95	90	80	80
36	140	130	110	100	100	90	80	75	70
40	130	110	110	100	95	85	70	65	65
44	120	110	100	95	90	80	70	60	60
48	100	80	70	70	70	65	60	55	55
52	90	80	70	50	50	50	50	40	40

REAR ENTRANCE DOOR

	4	8	12	16	20	24	28	32	34
4	200	200	200	200	200	200	185	160	150
8	200	200	200	200	200	180	160	145	130
12	200	200	190	180	165	155	140	130	115
16	200	200	180	155	145	135	125	115	110
20	200	200	165	145	125	120	115	105	95
24	200	180	155	135	120	110	105	95	90
28	185	160	140	125	115	105	95	90	80
32	160	145	130	115	105	95	90	80	70
36	140	125	115	105	95	90	85	75	
40	120	120	110	100	90	85	80	65	
44	120	110	100	90	85	80	70		
48	100	95	90	85	80	75	60		

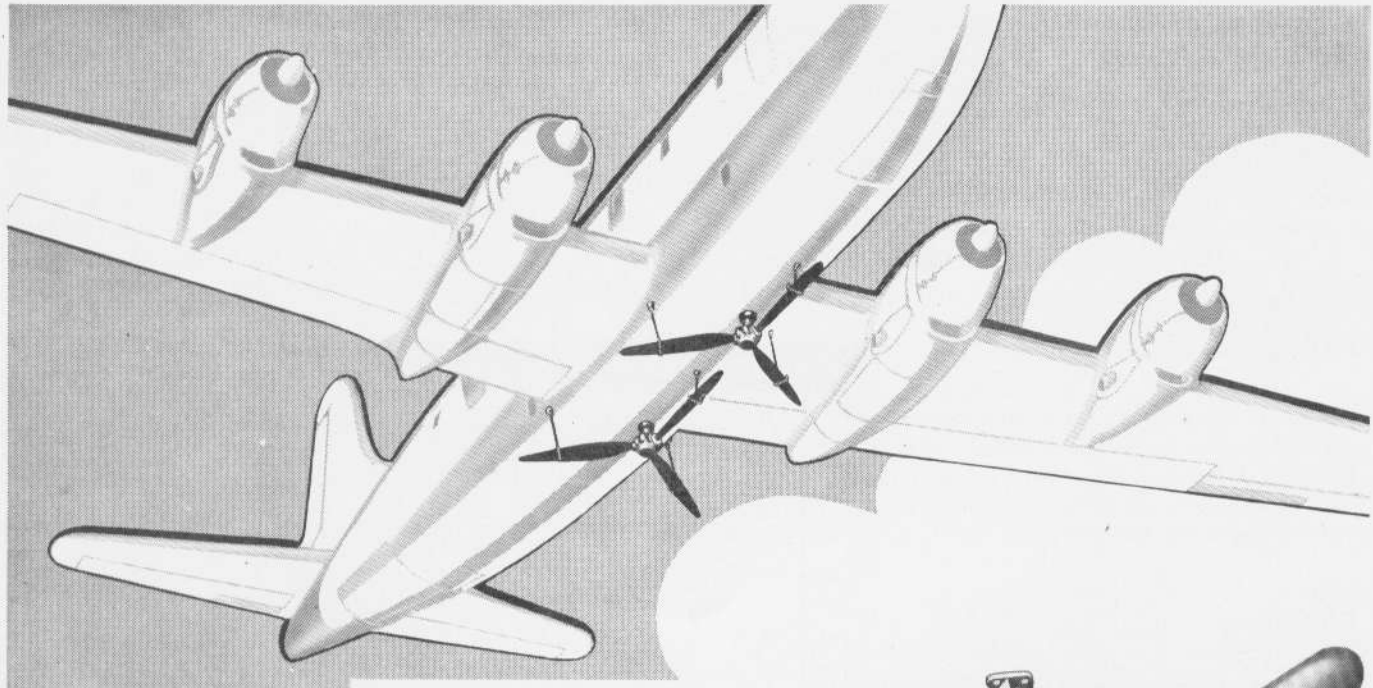
FORWARD CARGO HATCH

	4	8	12	16	20	24	28	32	36	40	42
4	168	168	167	167	167	166	166	90	80	72	69
8	168	166	166	166	165	165	164	90	80	72	69
12	167	166	153	152	152	151	150	89	80	72	69
16	167	166	152	132	132	131	130	89	79	72	68
20	167	165	152	132	117	117	116	88	79	71	68
24	166	165	151	131	117	105	104	88	79	71	68
28	166	164	150	130	116	104	96	87	78	70	67

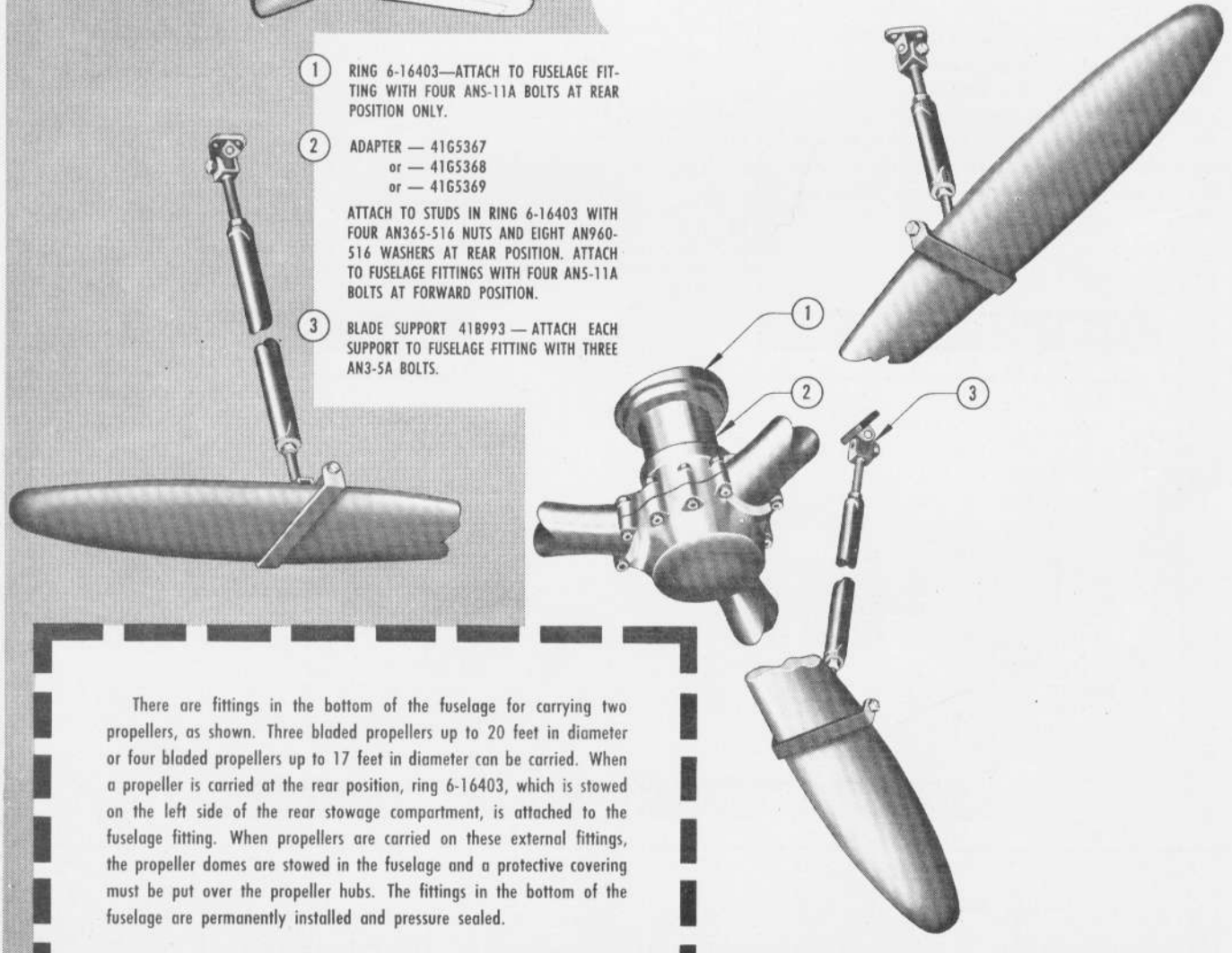
REAR CARGO HATCH

	4	8	12	16	20	24	28	32	36	40	42
4	155	155	155	155	155	155	155	155	150	125	125
8	155	130	130	130	130	130	125	125	125	100	100
12	155	130	110	110	110	110	105	105	105	85	85
16	155	130	110	95	95	95	95	95	95	70	70
20	155	130	110	95	85	85	80	80	80	65	65
24	155	130	110	95	85	70	70	70	70	55	55
26	155	130	110	95	85	70	55	55	55	45	45

17546



1. RING 6-16403—ATTACH TO FUSELAGE FITTING WITH FOUR AN5-11A BOLTS AT REAR POSITION ONLY.
2. ADAPTER — 41G5367
   or — 41G5368
   or — 41G5369
   ATTACH TO STUDS IN RING 6-16403 WITH FOUR AN365-516 NUTS AND EIGHT AN960-516 WASHERS AT REAR POSITION. ATTACH TO FUSELAGE FITTINGS WITH FOUR AN5-11A BOLTS AT FORWARD POSITION.
3. BLADE SUPPORT 41B993 — ATTACH EACH SUPPORT TO FUSELAGE FITTING WITH THREE AN3-5A BOLTS.



There are fittings in the bottom of the fuselage for carrying two propellers, as shown. Three bladed propellers up to 20 feet in diameter or four bladed propellers up to 17 feet in diameter can be carried. When a propeller is carried at the rear position, ring 6-16403, which is stowed on the left side of the rear stowage compartment, is attached to the fuselage fitting. When propellers are carried on these external fittings, the propeller domes are stowed in the fuselage and a protective covering must be put over the propeller hubs. The fittings in the bottom of the fuselage are permanently installed and pressure sealed.

Figure 4-21. Propeller Carrying Equipment

17547

4-51. CARGO TIE-DOWN FITTINGS. There are five types of fittings in the cargo compartments for tieing down cargo, securing stretcher supports, and attaching safety belts. They are all permanently installed except the engine-cradle tie-down fittings in the floor of the main cargo compartment.

4-52. AERIAL - DELIVERY CONTAINER SYSTEM. This airplane has a system for handling aerial-delivery cargo containers for supplying ground troops. The system will handle 17 bundles of five 300-pound containers, or a total weight of 25,500 pounds. The 17 bundles of containers are suspended along the overhead hoist rail and tied down to the floor of the main cargo compartment. A slack tow cable connects all bundles to an electric motor-and-drum unit at the rear of the main cargo compartment. As the electric motor-and-drum unit reels in the slack tow cable, the tie-downs are automatically released and each bundle is pulled along the overhead hoist rail to the cargo-door opening and automatically dropped. Static lines release a parachute in each container as the bundles are dropped. The slack in the tow cable is planned so that, as containers are dropped, the bundles still on the overhead rail move along so as to maintain the airplane CG within proper limits.

4-53. When the aerial-delivery container system is used, the cargo-loading ramps must be removed and either stowed in the main cargo compartment or removed from the airplane entirely. All seats in the main cargo compartment must be removed. A ballast of 3700 pounds must be carried in the lower rear cargo compartment during aerial-delivery operations.

4-54. The aerial-delivery system operator is stationed on the right side of the main cargo compartment forward of the main cargo doors. He has an interphone call box and a red-green signal light for coordination with the pilots. An "OFF," "ATTENTION," "READY," "RELEASE" switch on the pilots' and engineer's overhead switch panel operates the warning horn in the main cargo compartment and controls the signal lights at the operator's station. When the pilot signals, the operator opens the cargo doors and starts the motor-and-drum unit, which reels in the slack tow cable, releasing the tie-downs and dropping the 17 bundles of containers.

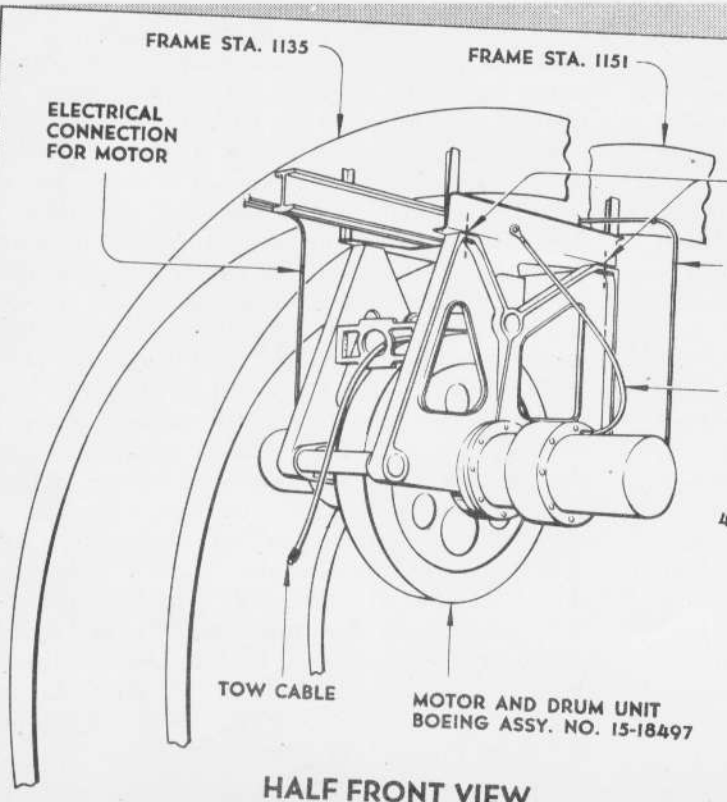
4-55. Instructions for installing the aerial-delivery container equipment and loading the containers are in the following figures. Placards with this information are installed on the left side of the main cargo compartment near the loading doors.

PARTS REQUIRED FOR INSTALLATION

QTY	PART NUMBER	NAME OF PART	LOCATION WHERE USED
17	BOEING ASSY NO. 15-18465	ADC TROLLEY	ATTACH TO RAIL TO SUPPORT BUNDLES. SEE FIGURE 4-25
17	BOEING ASSY NO. 9-11346	LOADING STRAP	USED AROUND BUNDLES FOR LOADING INTO THE AIRPLANE. SEE FIGURE 4-24
17	BOEING ASSY NO. 9-11364	BUNDLE SUPPORT STRAP	CONNECTED TO ADC TROLLEY TO SUPPORT BUNDLES. SEE FIGURE 4-25
17	BOEING ASSY NO. 15-18463	BUNDLE TIEDOWN STRAP	USED TO TIE BUNDLES TO FLOOR. SEE FIGURE 4-26
17	BOEING ASSY NO. 6-23047	LOCK ASSY-ADC TROLLEY	BOLT THE TROLLEY LOCK TO THE RAIL IN 17 PLACES. SEE FIGURES 4-28 AND 4-29
1	BOEING ASSY NO. 15 18497	ADC MOTOR & DRUM UNIT	INSTALL BETWEEN STA. 1135 & STA. 1151. SEE FIGURE 4-23
1	BOEING ASSY NO. 6-23052	RELEASE BAR	CONNECT TO HOIST TROLLEY FOR BUNDLE RELEASE. SEE FIGURE 4-27
1	BOEING ASSY NO. 9-9682	AUXILIARY HOIST TROLLEY	CONNECTED TO HOIST TROLLEY FOR HOISTING BUNDLES INTO AIRPLANE. FIGURE 4-24
4	AN5-11A	BOLT - AIRCRAFT	USED FOR MOUNTING MOTOR & DRUM. SEE FIGURE 4-23
4	AN365-524	NUT - SELF LOCKING	
51	AN3-7A	BOLT - AIRCRAFT	USED TO INSTALL 6-23047. SEE FIGURE 4-28
51	AN365-1032	NUT - SELF LOCKING	

Figure 4-22.

17548



HALF FRONT VIEW

INST. OF MOTOR AND DRUM

1. BOLT THE MOTOR AND DRUM UNIT TO ITS SUPPORT USING FOUR AN5-11A BOLTS AND FOUR AN365-524 NUTS.
2. ELECTRICAL CONNECTION FOR MOTOR. WHEN THE MOTOR AND DRUM UNIT IS REMOVED THE END OF THIS WIRE SHOULD BE TAPED AND CLIPPED TO ATTACHMENT PROVIDED ON FRAME AT STA. 1151.
3. CONNECT THE GROUND WIRE FROM EACH MOTOR TO THE BOLT ON THE SUPPORT BEAM. GROUND WIRE SHOULD BE REMOVED WITH THE MOTOR WHEN THE MOTOR IS REMOVED FROM THE AIRPLANE.
4. CHECK THE INSTALLATION OF THE MOTORS BY RUNNING THEM UNDER NO LOAD TOW CABLE NOT YET ATTACHED TO TROLLEYS FOR PERIODS NOT TO EXCEED 5 SECONDS. THE FOLLOWING CONDITIONS MUST BE OBSERVED
   - A. THE CARGO DOORS MUST BE UNLATCHED OR OPEN.
   - B. THE CARGO HOIST TROLLEY MUST BE AGAINST THE AFT TROLLEY STOP. SEE FIGURE 4-27

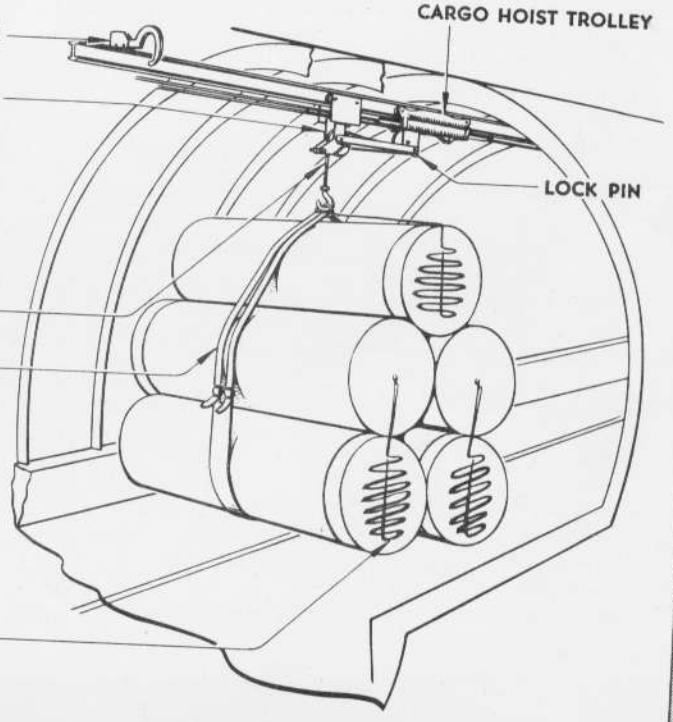
Figure 4-23.

17349

LOADING

1. PUSH ALL CABLE SUPPORT HOOKS UP OUT OF THE WAY.
2. CONNECT THE AUXILIARY HOIST TROLLEY, BOEING ASSY. NO. 9-9682, TO THE HOIST RAIL AND TO THE CARGO HOIST TROLLEY. IT IS NECESSARY TO REMOVE TWO BOLTS FROM THE AUXILIARY HOIST TROLLEY TO HINGE IT OPEN SO IT WILL CLAMP OVER THE RAIL. THE AUXILIARY HOIST TROLLEY IS CONNECTED TO THE HOIST TROLLEY BY ONE LOCK PIN.
3. PASS THE HOIST CABLE AROUND THE PULLEY IN THE HOIST TROLLEY AND LOOP OVER THE PULLEY IN THE AUXILIARY TROLLEY.
4. USE LOADING STRAP, BOEING PART NO. 9-11346, FOR PRE-ASSEMBLING THE BUNDLES OF AERIAL DELIVERY CONTAINERS. THE BUNDLES SHALL BE ASSEMBLED WITH NOT OVER FIVE CONTAINERS. THE TOTAL WEIGHT OF EACH BUNDLE SHALL NOT EXCEED 1500 POUNDS. THE LOADING STRAP MUST BE LOCATED AT THE CENTER OF GRAVITY OF BUNDLE.
5. HOIST THE PRE-ASSEMBLED BUNDLES OF AERIAL DELIVERY CONTAINERS INTO THE AIRPLANE WITH THE CARGO HOIST.

NOTE: CARE SHOULD BE TAKEN IN ASSEMBLING THE BUNDLES THAT THE CANOPIES AND STATIC LINES ARE PROPERLY ARRANGED AND ATTACHED FOR THE DAISY CHAIN METHOD OF DROPPING.



HALF FRONT VIEW

Figure 4-24.

17350

INST OF TROLLEY

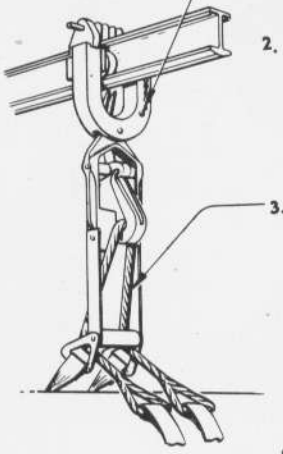
1. REMOVE PIN AND SPREAD YOKE TO INSTALL TROLLEY ON RAIL.

2. WHILE THE CARGO HOIST IS SUPPORTING THE AERIAL DELIVERY BUNDLE CONNECT THE ADC SUPPORT TROLLEY, BOEING ASSY. NO. 15-18465, TO THE HOIST RAIL.

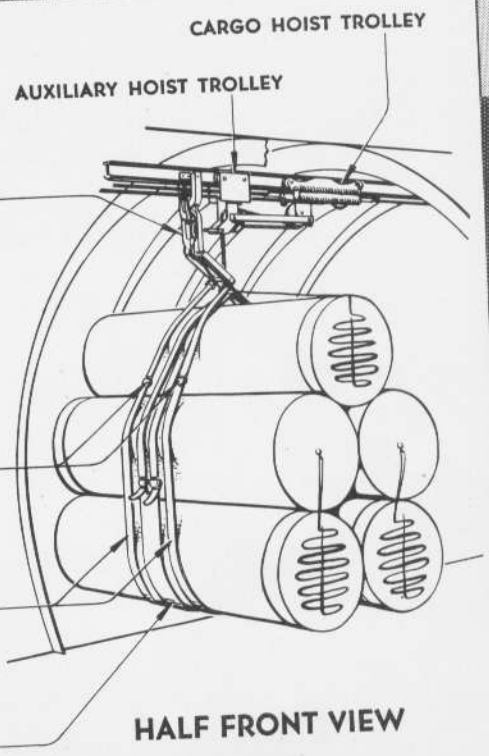
3. LOOP THE ROPE END OF THE BUNDLE SUPPORT STRAP, BOEING ASSY. NO. 9-11364, THRU THE TROLLEY AND OVER THE TROLLEY HOOK. WRAP THE SUPPORT STRAPS AROUND THE BUNDLE AND BUCKLE TO THE STRAPS ON THE TROLLEY. SPREAD SUPPORT STRAPS AT BOTTOM TO PROVIDE MORE STABLE SUPPORT.

4. TIGHTEN THE SUPPORT STRAPS. THEN LOWER THE BUNDLE WITH THE HOIST SO THE ADC TROLLEY IS SUPPORTING THE LOAD.

5. REMOVE THE LOADING STRAP FROM THE BUNDLE.



HALF REAR VIEW



HALF FRONT VIEW

Figure 4-25.

17551

LOCATION AND TIEDOWN

1. LOCATE BUNDLES AT TROLLEY LOCK AND SLIDE LOCK OVER TROLLEY. SEE FIGURE 4-30 FOR TROLLEY LOCATIONS .

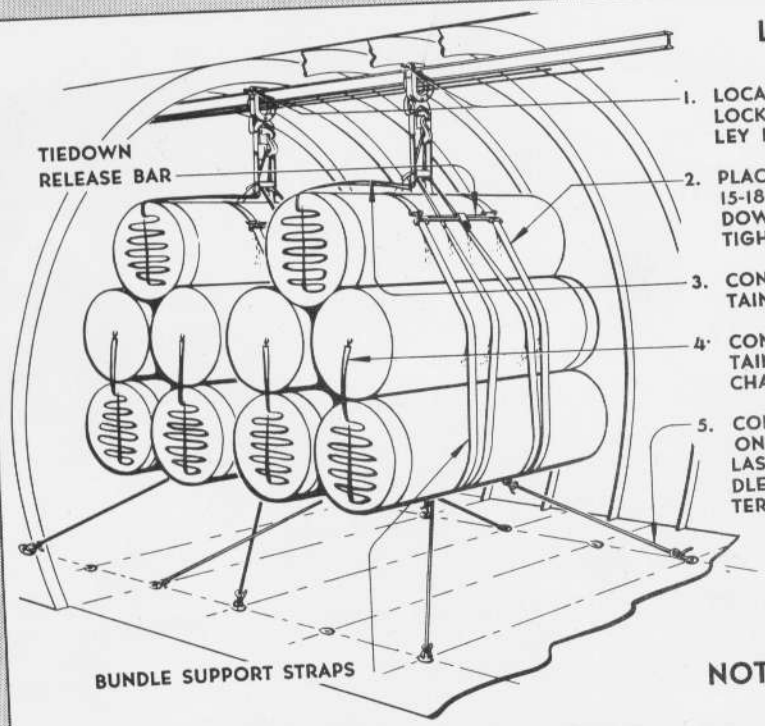
2. PLACE THE TIEDOWN STRAPS, BOEING ASSY. NO. 15-18463, AROUND BUNDLE LOCATING THE TIEDOWN RELEASE BAR WELL UP ON THE AFT SIDE. TIGHTEN THE STRAP BUCKLES.

3. CONNECT THE STATIC LINE FOR THE TOP CONTAINER TO THE TROLLEY LINK.

4. CONNECT THE STATIC LINE FOR THE LOWER CONTAINERS TO RELEASE THE CANOPIES IN A DAISY CHAIN SEQUENCE.

5. CONNECT TIEDOWN ROPES TO THE FOUR RINGS ON THE BOTTOM OF THE TIEDOWN STRAPS AND LASH TO THE FLOOR FITTINGS. TO MINIMIZE BUNDLE MOVEMENT IN FLIGHT, USE TIEDOWN PATTERN AS SHOWN.

NOTE: REMOVE FORWARD FLOOR HATCH COVER BEFORE INSTALLING BUNDLE AT STA. 281 TO PERMIT ACCESS BETWEEN UPPER AND LOWER COMPARTMENTS.



HALF REAR VIEW

Figure 4-26.

17552

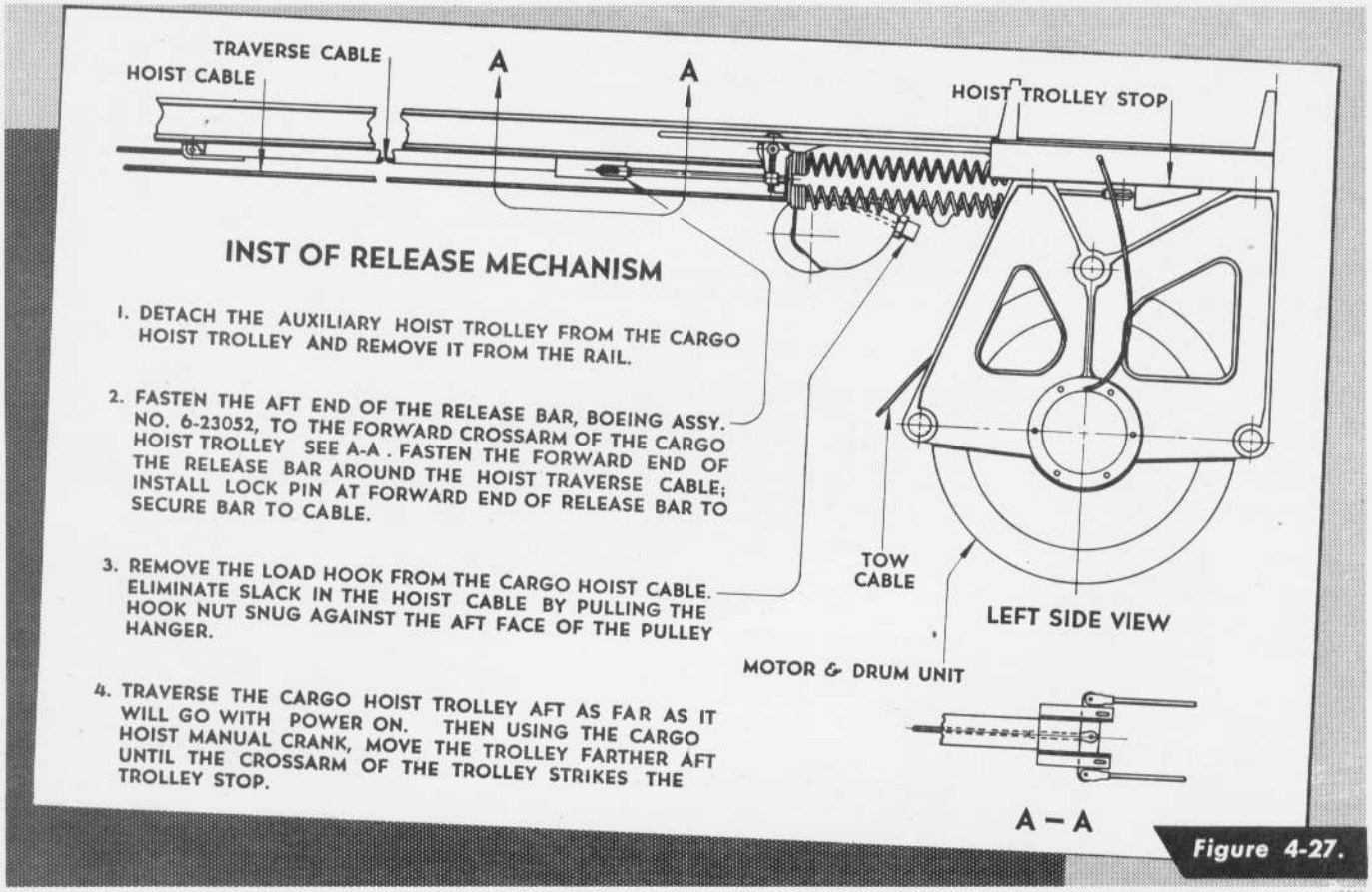


Figure 4-27.

17553

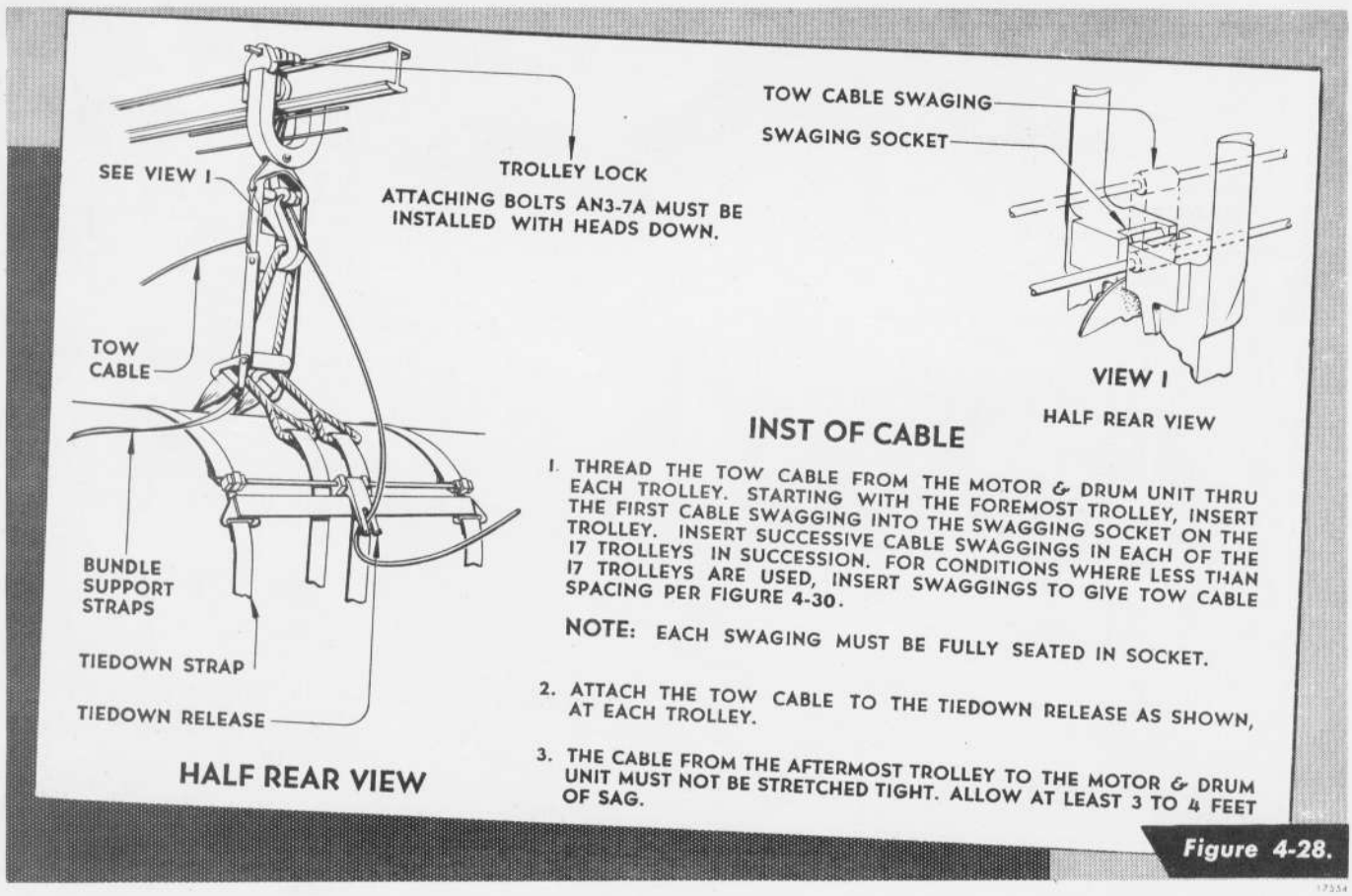
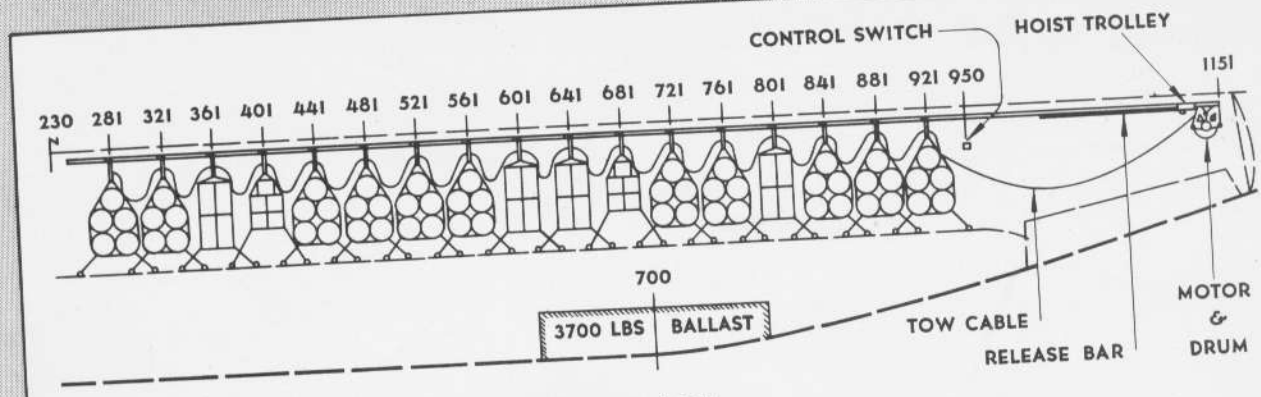


Figure 4-28.

17554



CHECK LIST

1. SEE THAT BALLAST IN LOWER AFT COMPARTMENT COMPLIES WITH THE LOAD DISTRIBUTION PLACARD AND IS SECURELY LASHED IN PLACE.

2. SET ADC CONTROL CIRCUIT BREAKER IN TAIL SKID RELAY SHIELD.

3. SEE THAT PILOTS OPERATING INSTRUCTIONS ARE IN PLACE IN THE CONTROL CABIN.

4. TEST THE PILOT'S SIGNAL SYSTEM--SWITCH ON OVERHEAD SWITCH PANEL SHOULD OPERATE HORN AND LIGHTS AT STATION 1010 ON THE RIGHT SIDE OF THE AIRPLANE.

Figure 4-29.

17555

ADC TROLLEY LOCATIONS

STATION LOCATION OF BUNDLES

NUMBER OF BUNDLES TO BE CARRIED

	281	321	361	401	441	481	521	561	601	641	681	721	761	801	841	881	921	
1																	*	1
2															120		*	2
3													120		120		*	3
4											120		120		120		*	4
5									120		120		120		120		*	5
6							120		120		120		120		180		*	6
7					120		120		120		120		180		140		*	7
8			120		120		120		120		180		140		140		*	8
9	120		120		120		120		180		140		140		140		*	9
10	120		120		120		120		180		140		140		70	70	*	10
11	120	120	120		120		180		140		140		140		70	70	*	11
12	120	120	120		120		180		140		140		70	70	70	70	*	12
13	120	120	120		120		180		140		70	70	70	70	70	70	*	13
14	120	120	120	120	180		140		140		70	70	70	70	89	89	*	14
15	120	120	120	120	180		140		70	70	70	70	70	70	89	89	*	15
16	120	120	120	120	100	80	140		70	70	70	70	70	70	89	89	*	16
17	120	120	120	120	100	80	70	70	70	70	70	70	70	70	89	89	*	17

THIS CHART SHOULD BE FOLLOWED FOR ALL PARTIAL ADC LOADINGS TO MAINTAIN PROPER BALANCE OF THE AIRPLANE BOTH DURING FLIGHT AND DISCHARGE OPERATIONS.

LOCATIONS SHOWN IN THIS CHART ARE BASED UPON BUNDLES WEIGHING 1500 POUNDS. WHEN BUNDLES OF VARYING WEIGHT ARE CARRIED, THE HEAVIER BUNDLES SHOULD BE LOCATED IN FORWARD POSITIONS.

WARNING - 3700 POUNDS BALLAST MUST BE CARRIED IN THE LOWER REAR COMPARTMENT AT STATION 700 FOR ALL ADC MISSIONS, AND A MINIMUM OF 1000 GAL. OF FUEL MUST BE IN THE AIRPLANE WHEN THE BUNDLES ARE DISCHARGED.

IN ANY LOADING CONDITION THE FIRST SWAGING ON THE END OF THE TOW CABLE CONNECTS TO THE FORMOST TROLLEY.

THE NUMBER GIVEN IN THE CIRCLE IS THE LENGTH OF TOW CABLE REQUIRED BETWEEN TROLLEYS. FOR PARTIAL LOADS THIS LENGTH MAY BE GREATER THAN THE SPACING OF ADJACENT SWAGINGS ON THE TOW CABLE IN WHICH CASE ONE SWAGING IS SKIPPED BETWEEN TROLLEYS.

* TO MOTOR AND DRUM UNIT.

Figure 4-30.

17556

THE ILLUSTRATIONS BELOW AND AT THE TOP OF THE NEXT PAGE SHOW THE AUTOMATIC RELEASE OF THE TIE-DOWNS, THE TROLLEY, AND THE CONTAINERS DURING THE OPERATION OF THE AERIAL DELIVERY CONTAINER SYSTEM

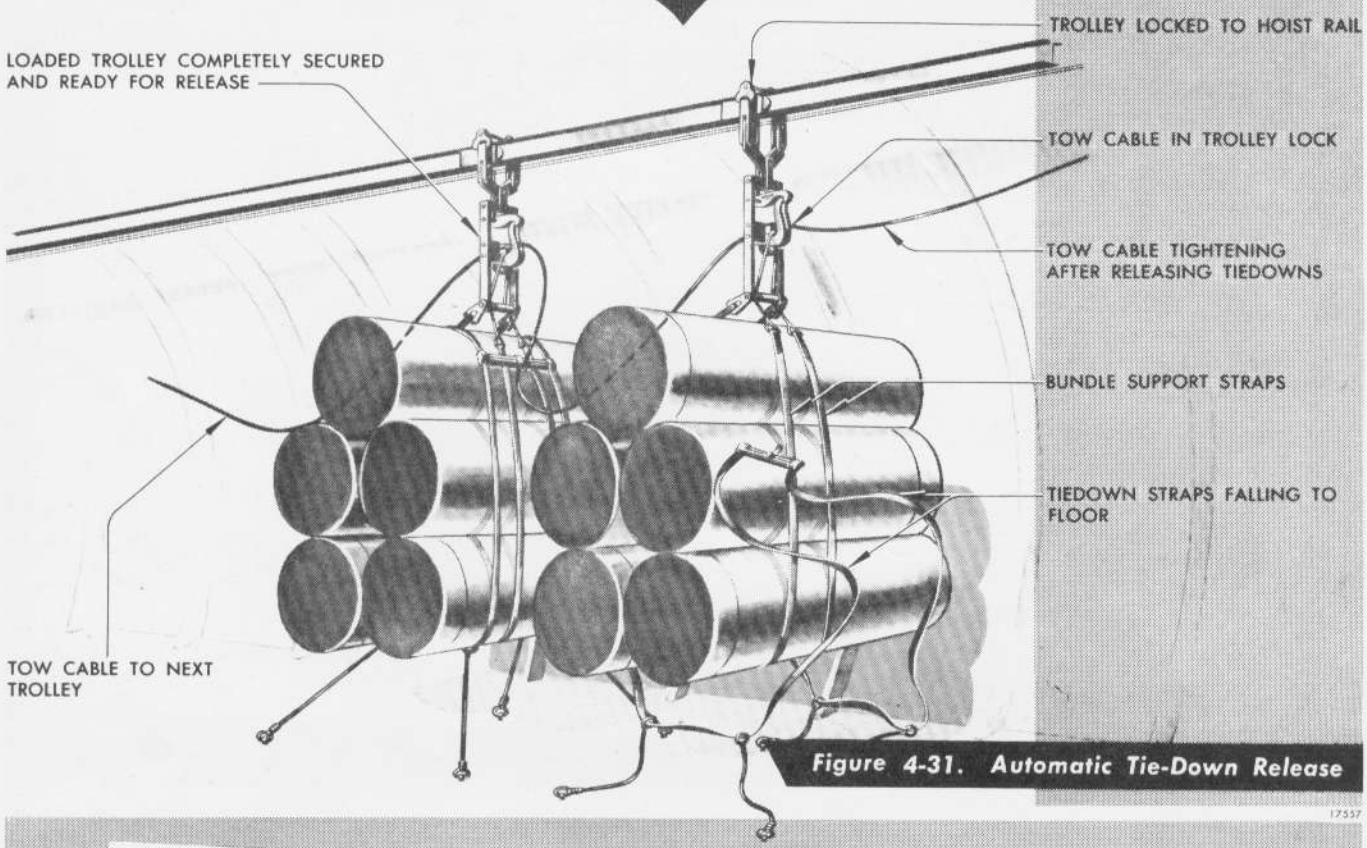


Figure 4-31. Automatic Tie-Down Release

17557

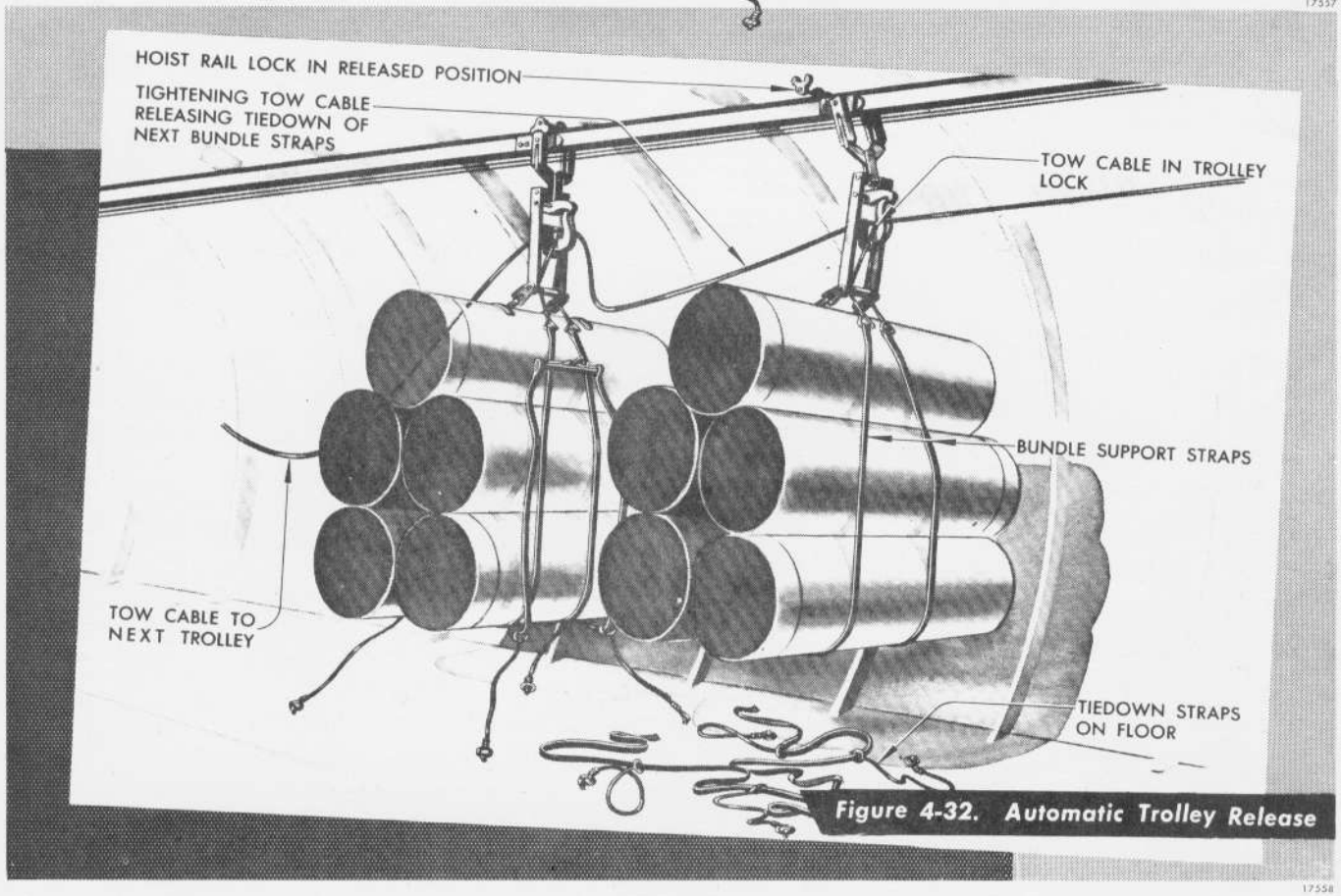


Figure 4-32. Automatic Trolley Release

17558

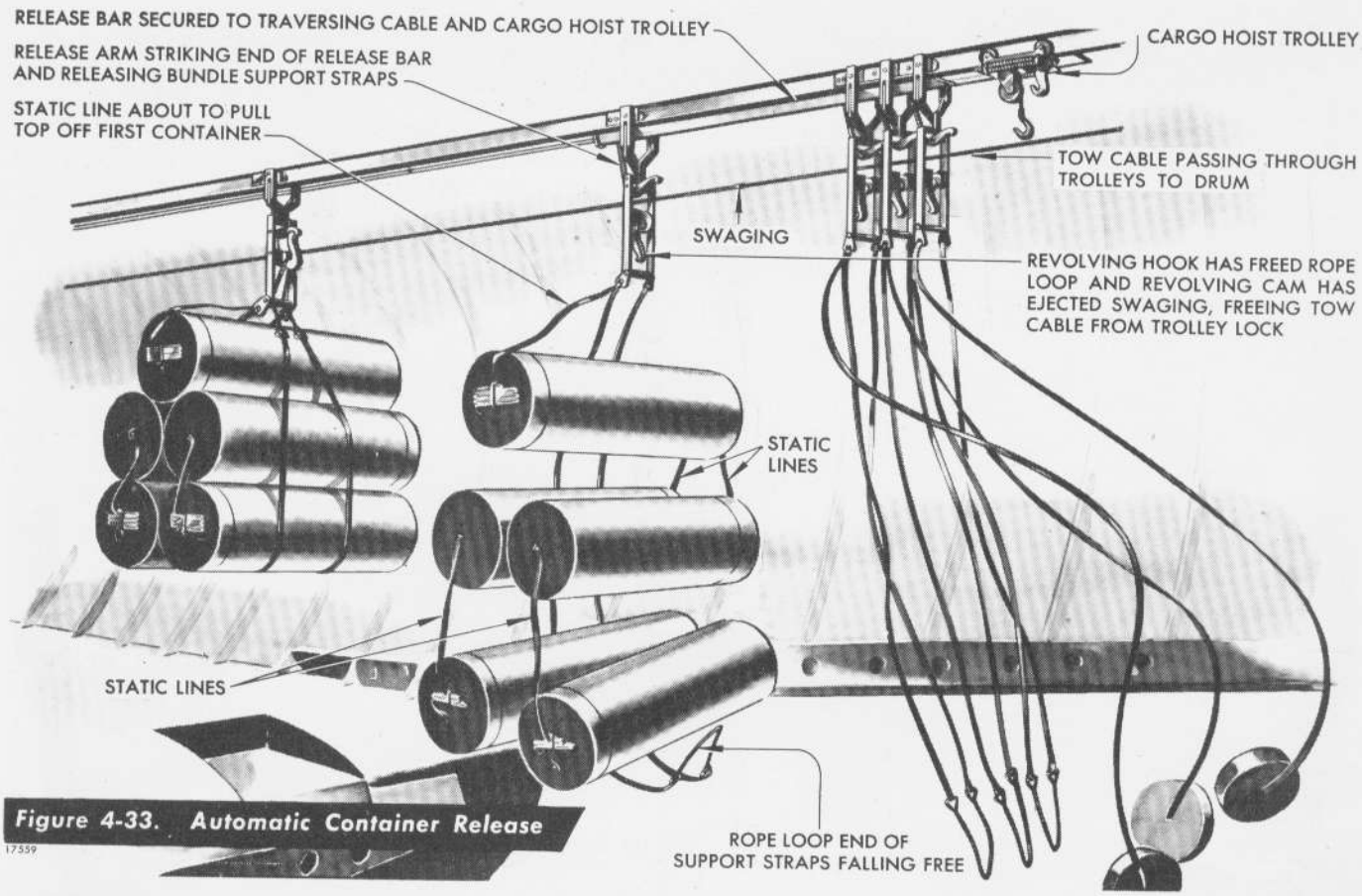


Figure 4-33. Automatic Container Release

17559

AERIAL DELIVERY SYSTEM
OPERATORS INSTRUCTIONS

PREPARATION

1. CHECK BUNDLES TO SEE THAT PARTS ARE CORRECTLY INSTALLED.
2. MAKE SURE TOW CABLE IS NOT TWISTED OR KINKED.
3. ATTACH HOIST CONTROL CORD TO OUTLET AT STATION 870.
4. MOVE CARGO HOIST CIRCUIT SWITCHES TO ON POSITION. SWITCHES LOCATED AT BLK. 230.

OPERATION

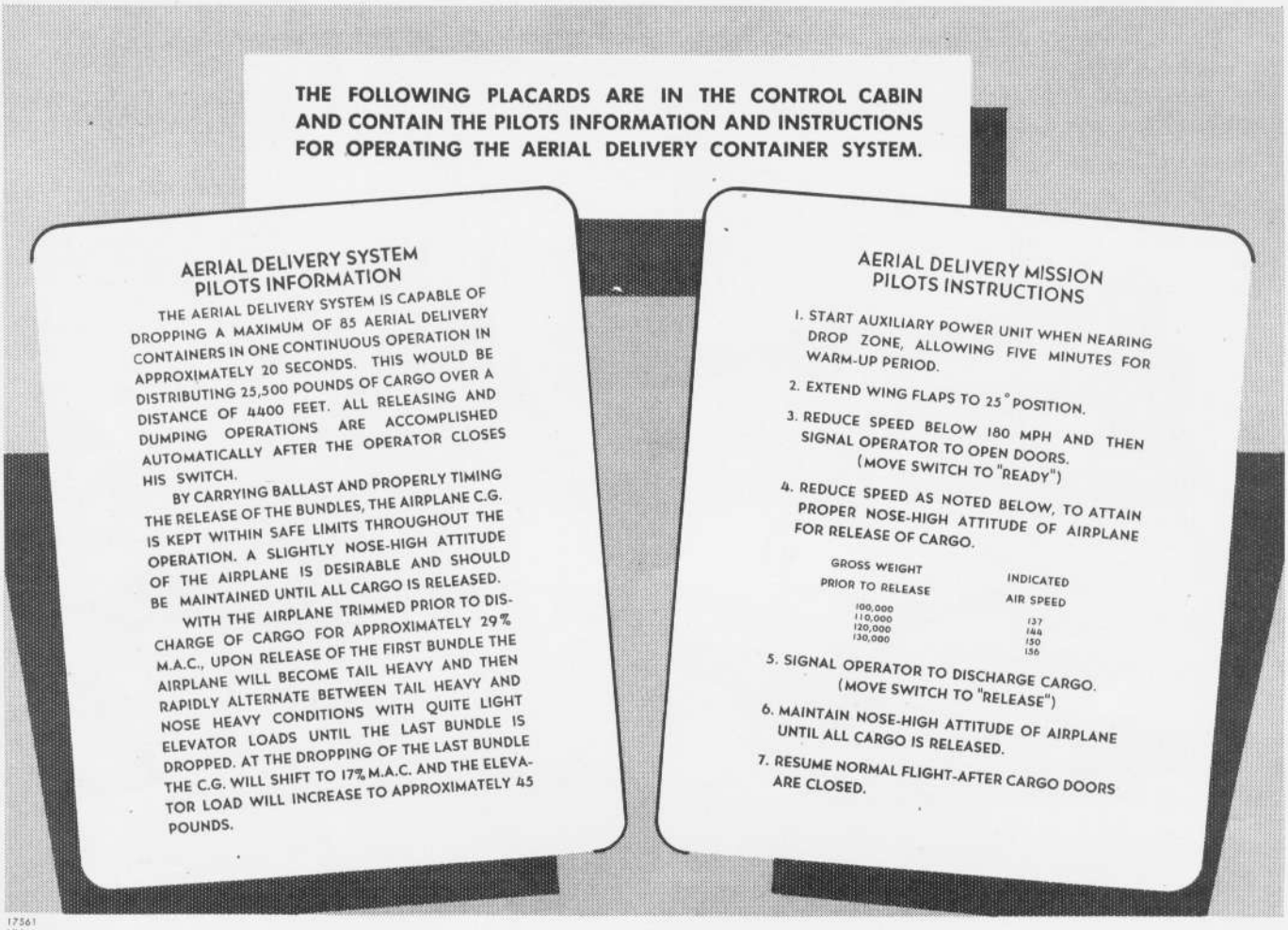
1. WHEN WARNING HORN SOUNDS, PLUG IN INTERPHONE FOR COMMUNICATION WITH PILOT.
2. RED SIGNAL FROM PILOT - OPEN CARGO DOORS.
3. GREEN SIGNAL FROM PILOT - CLOSE MOTOR SWITCH TO DISCHARGE CARGO. THE SWITCH MUST BE HELD IN CLOSED POSITION DURING DISCHARGE.
4. AFTER CARGO HAS BEEN DISCHARGED, TRAVERSE THE CARGO HOIST TROLLEY FORWARD TO PULL STATIC LINES INTO AIRPLANE.
5. CLOSE CARGO DOORS.

WARNING

DO NOT STOP THE DISCHARGE MOTORS AFTER THE DROPPING OPERATION HAS STARTED UNLESS--

1. THE TOW CABLE BRAKES.
2. SOME PART OF THE SYSTEM FAILS TO RELEASE AND REMAINS JAMMED FOR MORE THAN 30 SECONDS.

17560



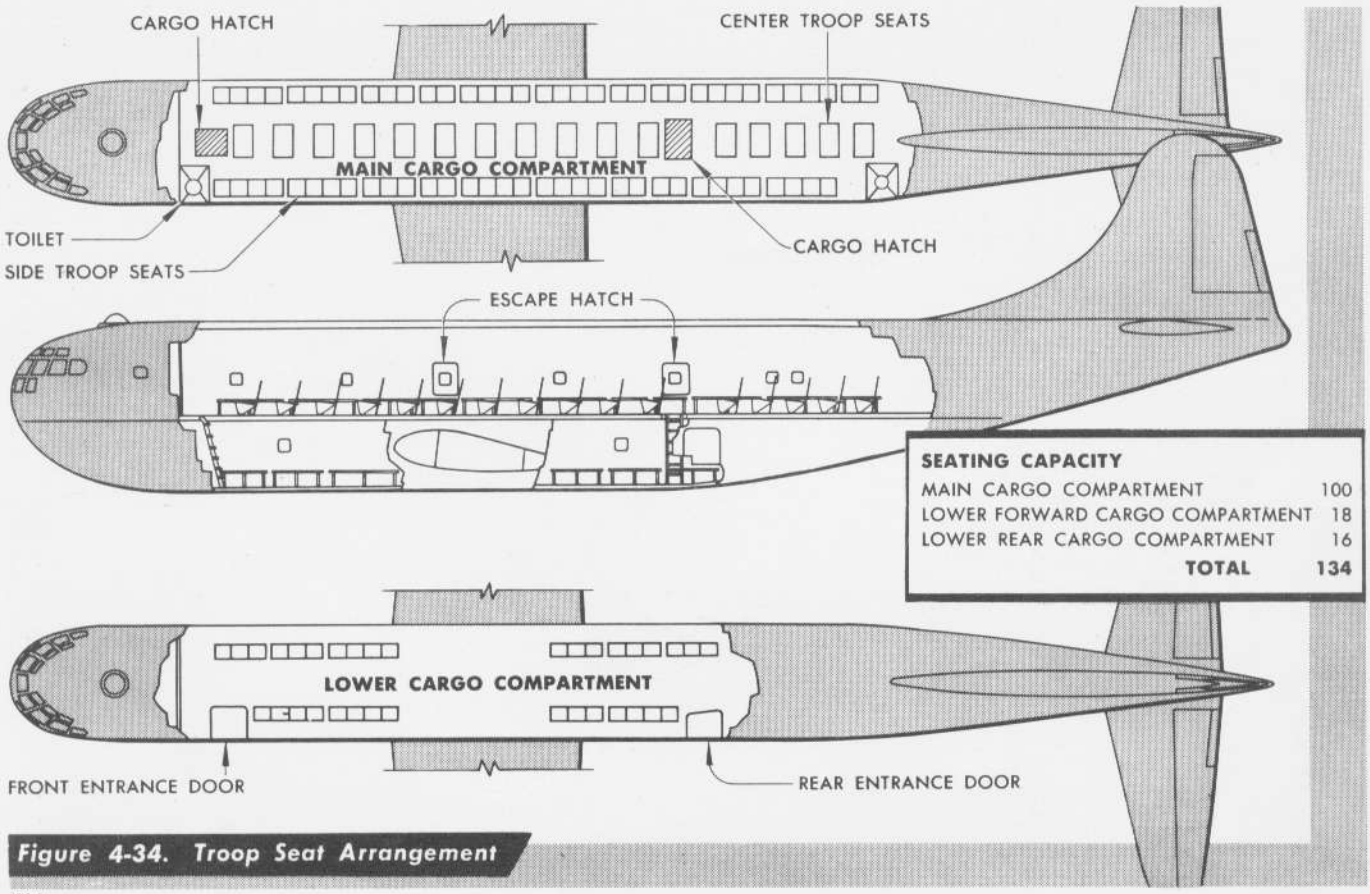
17561
17562

4-56. TROOP-CARRYING EQUIPMENT.

4-57. This airplane can carry 134 fully-equipped troops; 100 in the main cargo compartment, 18 in the lower forward cargo compartment, and 16 in the lower rear cargo compartment, *figure 4-34*. The 100 troops in the main cargo compartment are seated in 68 canvas seats which roll up and are stowed on the sides of the compartment, and 16 two-man seats which are readily removable and are stowed in the rear stowage compartment. The seats in the lower forward and lower rear cargo compartments are permanently installed and are not folding seats.

4-58. CASUALTY-CARRYING EQUIPMENT.

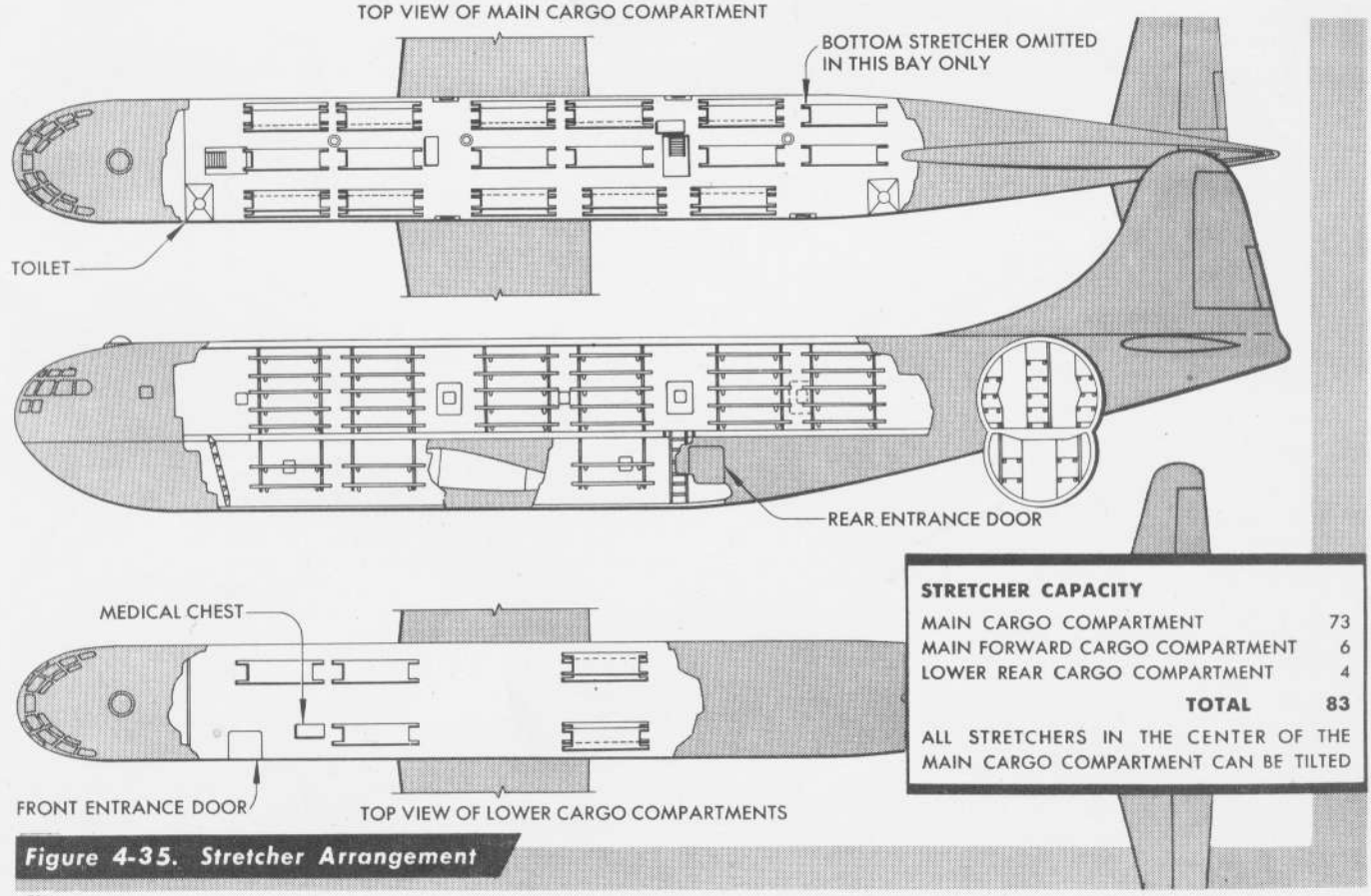
4-59. This airplane can carry 83 stretcher casualties; 73 in the main cargo compartment, 6 in the lower forward cargo compartment, and 4 in the lower rear cargo compartment, *figure 4-35*. The 73 stretchers in the main cargo compartment are installed in three tiers, one along each side of the compartment and one down the center of the compartment. A maximum of 43 stretchers can be installed in the two side tiers and allow cargo or troop seats in the center of the compartment. A maximum of 30 stretchers can be installed in the center tier and allow 68 troop seats along the sides of the compartment. All the stretchers in the center tier can be tilted by removing the bottom stretchers and connecting the rear end of the other stretchers to the clamps normally used for the next lower stretcher. The 6 stretchers in the lower forward cargo compartment are attached to permanently-installed stretcher supports. The 4 stretchers in the lower rear cargo compartment are placed against the sides of the compartment over the permanently-installed troop seats. The stretcher-support posts in the main cargo compartment are pivoted where they attach to the fuselage structure at the top of the compartment and are attached to fittings in the compartment floor at the bottom. The stretcher-support straps are permanently attached to the fuselage structure at the top of the compartment and are stowed in canvas containers attached to the structure adjacent to the straps. The support posts are stowed against the structure by disconnecting them from the floor fittings and swinging them up against the top of the compartment.



SEATING CAPACITY	
MAIN CARGO COMPARTMENT	100
LOWER FORWARD CARGO COMPARTMENT	18
LOWER REAR CARGO COMPARTMENT	16
TOTAL	**134**

Figure 4-34. Troop Seat Arrangement

17563



STRETCHER CAPACITY	
MAIN CARGO COMPARTMENT	73
MAIN FORWARD CARGO COMPARTMENT	6
LOWER REAR CARGO COMPARTMENT	4
TOTAL	**83**

ALL STRETCHERS IN THE CENTER OF THE MAIN CARGO COMPARTMENT CAN BE TILTED

Figure 4-35. Stretcher Arrangement

17564

PILOT'S NOTES

Appendix I

CHARTS

17305

INSTRUMENT AIRSPEED CORRECTED FOR INSTRUMENT ERROR	CORRECTED INDICATED AIRSPEED (25,500 FEET)	ALTIMETER ERROR	
		15,000 FEET	30,000 FEET
160	160	−27	−45
180	180	−34	−57
200	199	−41	−70
220	219	−51	−85
240	238	−60	−101
260	257	−70	−119
280	275	−81	−137

The corrected indicated airspeed includes pitot position and compressibility errors.

The airspeed indicator reads 1 percent low due to pitot position error.

Figure 5-1. Airspeed and Altitude Correction Chart

17475

POWER PLANT CHART

AIRCRAFT MODEL	PROPELLERS	ENGINE MODEL
YC-97	CURTISS ELECTRIC	R-3350-57

GAUGE READING	FUEL PRESS.	REAR OIL PRESS.	FRONT OIL PRESS.	OIL TEMP.	OIL (1) CONS.	CARB. AIR TEMP.
DESIRED MAXIMUM	16-18 19	60-80 80	30-50 55	50-85 95	- - 12	15-40 40
MINIMUM IDLING	15 15	60 20	25 20			

MAXIMUM PERMISSIBLE DIVING R P M: 3100

MINIMUM RECOMMENDED CRUISE R P M: 1400

MAXIMUM RECOMMENDED TURBO R P M: 26400

OIL GRADE: (S) 1120 (W) 1120

FUEL GRADE: 100-130 SPEC. AN-F-28

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
5 MINUTES			5 MINUTES			TIME LIMIT			UNLIMITED			UNLIMITED		
260°C			260°C			MAX. CYL. HD. TEMP.			248°C			232°C		
AUTO-RICH			AUTO-RICH			MIXTURE			AUTO-RICH			AUTO-LEAN		
2800			2600			R P M			2400			2200		
MANIF. PRESS.	SUPER-CHARGER	FUEL (2) Gal./Min.	MANIF. PRESS.	SUPER-CHARGER	FUEL (2) Gal./Min.	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH (3)	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH (3)
						-55.0	40,000 FT.	-67.0						
						-55.0	38,000 FT.	-67.0				33.0		135
						-55.0	36,000 FT.	-67.0	40.5		240	32.9		135
						-52.4	34,000 FT.	-62.3	40.4		240	32.8		135
			47.5		5.0	-48.4	32,000 FT.	-55.1	40.4		240	32.7		135
52.5		6.1	47.5		5.0	-44.4	30,000 FT.	-48.0	40.3		240	32.6		135
52.5		6.1	47.5		5.0	-40.5	28,000 FT.	-40.9	40.3		240	32.5		135
52.5		6.2	47.5		5.0	-36.5	26,000 FT.	-33.7	40.2		240	32.5		135
52.5		6.2	47.5		5.0	-32.5	24,000 FT.	-26.5	40.2		240	32.4		135
52.5		6.2	47.5		5.0	-28.6	22,000 FT.	-19.4	40.2		240	32.4		135
52.5		6.2	47.5		5.0	-24.6	20,000 FT.	-12.3	40.2		240	32.4		135
52.5		6.2	47.5		5.0	-20.7	18,000 FT.	- 5.2	40.3		240	32.5		135
52.5		6.2	47.5		5.0	-16.7	16,000 FT.	2.0	40.3		240	32.5		135
52.5		6.2	47.5		5.0	-12.7	14,000 FT.	9.1	40.4		240	32.6		135
52.5		6.1	47.5		5.0	- 8.8	12,000 FT.	16.2	40.5		240	32.8		135
52.5		6.1	47.5		5.0	- 4.8	10,000 FT.	23.4	40.6		240	33.1		135
52.5		6.1	47.5		4.9	- 0.8	8,000 FT.	30.5	40.8		240	33.4		135
52.5		6.0	47.5		4.9	3.1	6,000 FT.	37.6	41.0		240	33.8		135
52.5		6.0	47.5		4.8	7.1	4,000 FT.	44.7	41.3		240	34.3		135
52.5		5.9	47.5		4.8	11.0	2,000 FT.	51.8	41.6		240	34.8		135
52.5		5.9	47.5		4.8	15.0	SEA LEVEL	59.0	42.0		240	35.4		135

GENERAL NOTES

(1) Oil Consumption: Maximum allowable U.S. quart per hour per engine.

(2) *Gal./Min:* Approximate U.S. gallon per *minute* per engine. (5% CONSERVATIVE)

(3) GPH: Approximate U.S. gallon per hour per engine. (5% CONSERVATIVE)

ABOVE FIGURES ARE FOR LEVEL FLIGHT

NOTE

To determine consumption in British Imperial units, multiply by 10 then divide by 12.

TAKE-OFF CONDITIONS:
2800 RPM, 49"M.P. AUTO-RICH, 260°C MAX. CYL. HD. TEMP., 5 MINUTES

CONDITIONS TO AVOID:

SPECIAL NOTES

ABOVE FIGURES ARE BASED ON 25°C CARBURETOR AIR TEMPERATURE:
ADD 0.1" M.P. FOR EACH 3° INCREASE IN CARB. AIR TEMP.
SUBTRACT 0.1" M.P. FOR EACH 3° DECREASE IN CARB. AIR TEMP.

Figure 5-2. Power Plant Chart

DATA AS OF 9-15-45 BASED ON: XC-97 and B-29A FLIGHT TEST

17476

MANIFOLD PRESSURE

Normal (Auto Lean)	24 to 35 inches
Normal (Auto Rich)	35 to 43.5 inches
Maximum (Takeoff)	49 inches
Maximum (Emergency)	52.5 inches

RPM

Normal (Auto Lean)	1400 to 2200 rpm
Normal (Auto Rich)	2200 to 2400 rpm
Maximum	2800 rpm

AIRSPEED

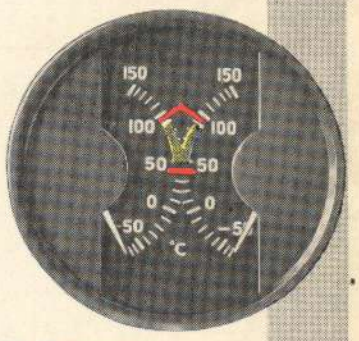
Limit	300 mph
Limit (Flaps Down)	180 mph

FUEL PRESSURE

Minimum	15 psi
Normal	15 to 19 psi
Maximum (Emergency)	25 psi

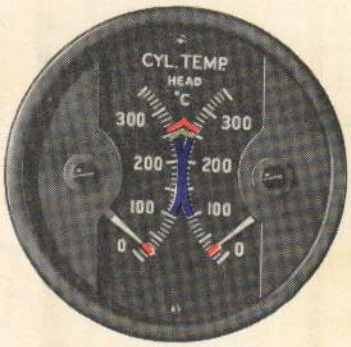
OIL PRESSURE

Front—	Minimum	25 psi
	Normal	30 to 50 psi
	Maximum	55 psi
Rear—	Minimum	60 psi
	Normal	60 to 80 psi
	Maximum	80 psi



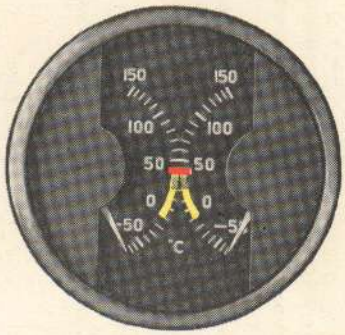
OIL TEMPERATURE

Minimum	40°C
Normal	50° to 85°C
Maximum	95°C



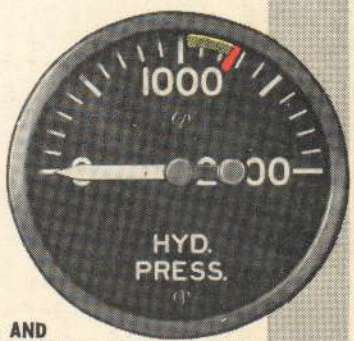
CYLINDER HEAD TEMPERATURE

Minimum	25°C
Normal (Auto Lean)	100° to 232°C
Normal (Auto Rich)	232° to 248°C
Maximum	260°C



CARBURETOR AIR TEMPERATURE

Caution (Icing)	—10° to 15°C
Normal	15° to 40°C
Maximum	40°C



MAIN AND EMERGENCY HYDRAULIC PRESSURES

Normal	1025 to 1225 psi
Maximum	1225 psi

VACUUM

Minimum	3.8 inches
Normal	3.8 to 4.2 inches
Maximum	4.2 inches

DEICING PRESSURE

Normal	6 to 8.5 psi
Maximum	10 psi

Figure 5-3. Instrument Markings

17491

AIRCRAFT MODEL
YC-97

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL
R-3350-57

TAKE-OFF DISTANCE FEET

GROSS WEIGHT LB.	HEAD WIND MPH	HEAD WIND KTS.	HARD SURFACE RUNWAY AT SEA LEVEL GROUND RUN	HARD SURFACE RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	HARD SURFACE RUNWAY AT 3000 FEET GROUND RUN	HARD SURFACE RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	HARD SURFACE RUNWAY AT 6000 FEET GROUND RUN	HARD SURFACE RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT SEA LEVEL GROUND RUN	SOD-TURF RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT 3000 FEET GROUND RUN	SOD-TURF RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT 6000 FEET GROUND RUN	SOD-TURF RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT SEA LEVEL GROUND RUN	SOFT SURFACE RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT 3000 FEET GROUND RUN	SOFT SURFACE RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT 6000 FEET GROUND RUN	SOFT SURFACE RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.
130,000	0		4250	6250	4775	7100	5400	8000	5200	7200	5775	8100	6750	9350	7750	9750	8400	11000	11400	14000
	20		3125	4925	3525	5600	4050	6250	3800	5600	4325	6400	5200	7400	5800	7600	6300	8500	9000	11200
	40		2275	3750	2575	4325	2900	4750	2825	4300	3050	4800	3850	5700	4275	5750	4550	6400	6750	8600
110,000	0		2725	4000	3075	4525	3500	5100	3200	4475	3600	5050	4300	5900	4375	5650	4900	6500	6200	7800
	20		2100	3125	2350	3575	2750	4050	2475	3500	2775	4000	3300	4600	3400	4425	3750	5050	4850	6150
	40		1525	2350	1775	2750	1950	3000	1775	2600	2050	3000	2450	3500	2525	3350	2800	3850	3550	4600
90,000	0		1750	2575	1975	2900	2225	3300	1975	2800	2275	3200	2525	3600	2500	3325	2725	3800	3325	4400
	20		1400	2000	1550	2300	1675	2500	1560	2150	1700	2450	1975	2800	1950	2550	2125	2950	2575	3400
	40		1075	1550	1200	1750	1325	1950	1175	1650	1350	1900	1475	2100	1425	1900	1575	2200	1925	2550

NOTE: INCREASE CHART DISTANCES AS FOLLOWS: 75°F + 10%; 100°F + 20%; 125°F + 30%; 150°F + 40%

OPTIMUM TAKE-OFF WITH 2800 RPM, 49 IN. H G. & 25 DEG. FLAP IS 80% OF CHART VALUES

DATA AS OF 2-20-45 BASED ON XC-97 and B-29A FLIGHT TEST

CLIMB DATA

GROSS WEIGHT LB.	AT SEA LEVEL BEST C.A.S. MPH	AT SEA LEVEL BEST C.A.S. KTS.	AT SEA LEVEL RATE OF CLIMB F.P.M.	AT SEA LEVEL GAL. OF FUEL USED	AT 5,000 FEET BEST C.A.S. MPH	AT 5,000 FEET BEST C.A.S. KTS.	AT 5,000 FEET RATE OF CLIMB F.P.M.	AT 5,000 FEET FROM SEA LEVEL TIME MIN.	AT 5,000 FEET FROM SEA LEVEL FUEL USED	AT 10,000 FEET BEST C.A.S. MPH	AT 10,000 FEET BEST C.A.S. KTS.	AT 10,000 FEET RATE OF CLIMB F.P.M.	AT 10,000 FEET FROM SEA LEVEL TIME MIN.	AT 10,000 FEET FROM SEA LEVEL FUEL USED	AT 15,000 FEET BEST C.A.S. MPH	AT 15,000 FEET BEST C.A.S. KTS.	AT 15,000 FEET RATE OF CLIMB F.P.M.	AT 15,000 FEET FROM SEA LEVEL TIME MIN.	AT 15,000 FEET FROM SEA LEVEL FUEL USED	AT 25,000 FEET BEST C.A.S. MPH	AT 25,000 FEET BEST C.A.S. KTS.	AT 25,000 FEET RATE OF CLIMB F.P.M.	AT 25,000 FEET FROM SEA LEVEL TIME MIN.	AT 25,000 FEET FROM SEA LEVEL FUEL USED	AT 30,000 FEET BEST C.A.S. MPH	AT 30,000 FEET BEST C.A.S. KTS.	AT 30,000 FEET RATE OF CLIMB F.P.M.	AT 30,000 FEET FROM SEA LEVEL TIME MIN.	AT 30,000 FEET FROM SEA LEVEL FUEL USED
130,000	190		670	90	190		610	8.0	210	190		520	16.5	340	190		410	27.0	500	190		140	64.1	1090					
110,000	190		1030	90	190		960	5.0	165	190		860	10.5	250	190		740	16.5	340	190		435	33.5	580	190		250	49.0	630
90,000	190		1430	90	190		1360	3.5	145	190		1260	7.5	205	190		1140	11.5	265	190		850	21.5	415	190		690	27.5	505

ABOVE FIGURES ARE BASED ON POWER SETTINGS IN ACCORDANCE WITH FIG. 5-2 AT 2400 RPM, WHICH GIVES 2000 BHP.

DATA AS OF 9-15-45 BASED ON XC-97 and B-29A FLIGHT TEST

FUEL USED (U.S. GAL.) INCLUDES WARM-UP & TAKE-OFF ALLOWANCE

LANDING DISTANCE FEET

GROSS WEIGHT LB.	BEST C.A.S. APPROACH POWER OFF MPH	POWER OFF KTS.	POWER ON MPH	POWER ON KTS.	HARD DRY SURFACE AT SEA LEVEL GROUND ROLL	HARD DRY SURFACE AT SEA LEVEL TO CLEAR 50' OBJ.	HARD DRY SURFACE AT 3000 FEET GROUND ROLL	HARD DRY SURFACE AT 3000 FEET TO CLEAR 50' OBJ.	HARD DRY SURFACE AT 6000 FEET GROUND ROLL	HARD DRY SURFACE AT 6000 FEET TO CLEAR 50' OBJ.	FIRM DRY SOD AT SEA LEVEL GROUND ROLL	FIRM DRY SOD AT SEA LEVEL TO CLEAR 50' OBJ.	FIRM DRY SOD AT 3000 FEET GROUND ROLL	FIRM DRY SOD AT 3000 FEET TO CLEAR 50' OBJ.	FIRM DRY SOD AT 6000 FEET GROUND ROLL	FIRM DRY SOD AT 6000 FEET TO CLEAR 50' OBJ.	WET OR SLIPPERY AT SEA LEVEL GROUND ROLL	WET OR SLIPPERY AT SEA LEVEL TO CLEAR 50' OBJ.	WET OR SLIPPERY AT 3000 FEET GROUND ROLL	WET OR SLIPPERY AT 3000 FEET TO CLEAR 50' OBJ.	WET OR SLIPPERY AT 6000 FEET GROUND ROLL	WET OR SLIPPERY AT 6000 FEET TO CLEAR 50' OBJ.
90,000	125		125		2370	3150	2580	3450	2820	3750	2640	3420	2880	3750	3150	4080	6120	6900	6690	7560	7320	8250

DATA AS OF 2-20-45 BASED ON: XC-97 and B-29A FLIGHT TEST

OPTIMUM LANDING IS 80% OF CHART VALUES

REMARKS:

NOTE: TO DETERMINE FUEL CONSUMPTION IN BRITISH IMPERIAL GALLONS, MULTIPLY BY 10, THEN DIVIDE BY 12.

LEGEND

C.A.S.: CALIBRATED AIRSPEED
MPH: MILES PER HOUR
KTS.: KNOTS
F.P.M.: FEET PER MINUTE

AIRCRAFT MODEL: YC-97

ENGINE: R-3350-57

FLIGHT OPERATION INSTRUCTION CHART

HOT DAY - NO WIND

CHART WEIGHT LIMITS: 140,000 TO 130,000 POUNDS

EXTERNAL LOAD ITEMS:

NUMBER OF ENGINES OPERATING: FOUR (4)

For details, see power plant chart. Fig. 5-2

LIMITS	R P M	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOT. G.P.H.
WAR EMERG.	2800	52.5	- -	A. R.	5	260	1240
MILITARY POWER	2600	47.5	- -	A. R.	5	260	1200

INSTRUCTIONS FOR USING CHART

Select figure in fuel column equal to or less than amount of fuel to be used for cruising,[1] move horizontally to right or left and select range value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite value nearest desired cruising altitude (ALT.) read RPM, manifold pressure (M.P.) and mixture setting required.

NOTES

APPROXIMATE VALUES FOR REFERENCE { (MI./GAL.) Air miles per gallon (no wind). (G.P.H.) Gallons per hour. (T.A.S.) True airspeed

(1) Range values are for an average airplane flying alone (no wind).

To obtain BRITISH IMPERIAL GAL. (or G.P.H.): multiply U. S. GAL. (or G.P.H.) by 10, then divide by 12. Column I is for emergency high speed cruising only. Columns II, III, IV, V give progressive increase in range at a sacrifice in speed.

COLUMN I

RANGE IN AIRMILES STATUTE	RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.
		9548
2700	2350	8800
2580	2240	8400
2450	2130	8000
2330	2020	7600
2200	1910	7200
2070	1800	6800
1950	1690	6400
1820	1580	6000
1690	1470	5600
1580	1370	5200
1460	1270	4800

MAXIMUM CONTINUOUS

R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET
						40000
						35000
						30000
						25000
			(See	Col.	II)	20000
2400	40.3	A. R.	915	300	261	15000
2400	40.6	A. R.	920	291	253	10000
2400	41.2	A. R.	910	281	244	5000
2400	42.0	A. R.	900	270	235	S.L.

COLUMN II

RANGE IN AIRMILES STATUTE	RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.
	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]	9548
3420	2970	8800
3230	2810	8400
3050	2650	8000
2880	2500	7600
2700	2350	7200
2530	2200	6800
2360	2050	6400
2200	1910	6000
2030	1760	5600
1860	1620	5200
1710	1490	4800

(.345 STAT. (.30 NAUT.) MI./GAL.)

R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET
						40000
						35000
						30000
						25000
2400	40.2	A. R.	910	313	272	20000
2370	38.9	A. R.	857	296	257	15000
2350	38.5	A. R.	823	283	246	10000
2320	38.2	A. R.	774	267	232	5000
2300	38.5	A. R.	737	254	221	S.L.

COLUMN III

RANGE IN AIRMILES STATUTE	RANGE IN AIRMILES NAUTICAL
4080	3550
3850	3350
3620	3150
3410	2960
3190	2770
2970	2580
2750	2390
2550	2220
2350	2040
2140	1860
1960	1700

(.39 STAT. (.34 NAUT.) MI./GAL.)

R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.
2240	34.7	A. R.	650	254	221
2220	34.8	A. R.	626	246	214
2210	35.7	A. R.	612	238	207

COLUMN IV

RANGE IN AIRMILES STATUTE	RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.
4810	4180	8800
4530	3940	8400
4260	3700	8000
4000	3480	7600
3750	3260	7200
3500	3040	6800
3240	2820	6400
3010	2620	6000
2780	2420	5600
2550	2220	5200
2340	2030	4800

(.46 STAT. (.40 NAUT.) MI./GAL.)

R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET
						40000
						35000
						30000
						25000
						20000
						15000
2200	34.1	A. L.	505	235	204	10000
2200	35.4	A. L.	500	233	203	5000

COLUMN V

RANGE IN AIRMILES STATUTE	RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.
		9548
5410	4700	8800
4970	4320	8400
4770	4150	8000
4480	3900	7600
4200	3650	7200
3910	3400	6800
3630	3150	6400
3360	2920	6000
3090	2690	5600
2830	2460	5200
2590	2250	4800

MAXIMUM AIR RANGE

R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET
						40000
						35000
						30000
						25000
						20000
						15000
						10000
						5000
2130	33.8	A. L.	441	219	190	S.L.

Figure 5-5. Flight Operation Instruction Chart 140,000 to 130,000 Pounds Gross Weight

SPECIAL NOTES

(1) Make allowance for warm-up, take-off and climb (see fig. 5-4)

(2) Range values listed in column I are for 1000 ft. pressure altitude.

(3) For maximum range at any given altitude, use power setting in column farthest to the right.

EXAMPLE

At 135000 lb. gross weight with 6000 gal. of fuel (after deducting total allowances of 365 gal.) to fly 2550 stat. airmiles at 10000 ft. altitude maintain 2240 RPM and 34.7 in. manifold pressure with mixture set : Auto-Rich until Gr. Wt. is reduced to 130,000 lbs. then use settings in Col. III, fig 5-6

LEGEND

ALT.: Pressure Altitude
M.P.: Manifold Pressure
G.P.H.: U.S. Gal. Per Hour
T.A.S.: True Airspeed
KTS.: Knots
A.R.: Auto-Rich
A.L.: Auto-Lean
S.L.: Sea Level - 1000'

DATA AS OF 15 Sept. 1945 BASED ON: XC-97 and B-29 FLIGHT TEST

AIRCRAFT MODEL: YC-97

ENGINE: R-3350-57

FLIGHT OPERATION INSTRUCTION CHART

HOT DAY - NO WIND

CHART WEIGHT LIMITS: 130,000 TO 120,000 POUNDS

EXTERNAL LOAD ITEMS:

NUMBER OF ENGINES OPERATING: FOUR(4)

For details, see power plant chart. Fig. 5-2

LIMITS	R P M	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOT. G.P.H.
WAR EMERG.	2800	52.5	- -	A. R.	5	260	1350
MILITARY POWER	2600	47.5	- -	A. R.	5	260	1200

INSTRUCTIONS FOR USING CHART

Select figure in fuel column equal to or less than amount of fuel to be used for cruising,(1) move horizontally to right or left and select range value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite value nearest desired cruising altitude (ALT.) read RPM, manifold pressure (M.P.) and mixture setting required.

NOTES

APPROXIMATE VALUES FOR REFERENCE { (MI./GAL.) Air miles per gallon (no wind). (G.P.H.) Gallons per hour. (T.A.S.) True airspeed

Range values are for an average airplane flying alone (no wind).(1)

To obtain BRITISH IMPERIAL GAL. (or G.P.H.): multiply U. S. GAL. (or G.P.H.) by 10, then divide by 12. Column I is for emergency high speed cruising only. Columns II, III, IV, V give progressive increase in range at a sacrifice in speed.

Figure 5-6. Flight Operation Instruction Chart 130,000 to 120,000 Pounds Gross Weight

COLUMN I (2) RANGE IN AIRMILES STATUTE	COLUMN I (2) RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN V (3) RANGE IN AIRMILES STATUTE	COLUMN V (3) RANGE IN AIRMILES NAUTICAL
		8268	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING (1)						8268		
2230	1940	7200	2870	2500	3470	3020	4090	3560	7200	4640	4030
2110	1830	6800	2690	2340	3240	2820	3820	3320	6800	4320	3750
1980	1720	6400	2510	2180	3020	2620	3540	3080	6400	4000	3480
1850	1610	6000	2330	2030	2800	2430	3290	2860	6000	3720	3230
1730	1500	5600	2160	1880	2580	2240	3040	2640	5600	3430	2980
1600	1390	5200	1990	1730	2360	2050	2780	2420	5200	3140	2730
1470	1280	4800	1820	1580	2140	1860	2530	2200	4800	2850	2480
1350	1170	4400	1660	1440	1940	1690	2300	2000	4400	2590	2250
1220	1060	4000	1480	1290	1740	1510	2070	1800	4000	2320	2020
1090	950	3600	1320	1150	1530	1330	1840	1600	3600	2070	1800
965	840	3200	1160	1010	1340	1160	1610	1400	3200	1810	1570

MAXIMUM CONTINUOUS

R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	(.36 STAT. (.31 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.40 STAT. (.35 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.49 STAT. (.425 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET
						40000																			40000
						35000																			35000
						30000																			30000
			(See	Col.	11)	25000	2400	40.2	A. R.	910	325	283													25000
2400	40.2	A. R.	910	320	279	20000	2380	39.4	A. R.	875	315	274													20000
2400	40.3	A. R.	915	308	268	15000	2360	38.5	A. R.	845	301	262	2260	34.6	A. R.	691	278	242							15000
2400	40.6	A. R.	920	296	257	10000	2340	38.1	A. R.	800	285	248	2250	34.9	A. R.	666	267	232	2200	33.1	A. L.	505	246	214	10000
2400	41.2	A. R.	910	284	247	5000	2310	37.7	A. R.	758	270	235	2220	34.8	A. R.	632	254	221	2190	34.0	A. L.	497	243	211	5000
2400	42.0	A. R.	900	273	237	S.L.	2300	38.5	A. R.	734	261	227	2200	35.4	A. R.	598	242	210	2180	35.0	A. L.	487	238	207	S.L.

MAXIMUM AIR RANGE

PRESS ALT. FEET	R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.
40000						
35000						
30000						
25000						
20000						
15000						
10000						
5000	2080	31.1	A. L.	400	216	188
S.L.	2050	31.8	A. L.	382	209	182

SPECIAL NOTES

(1) Make allowance for warm-up, take-off and climb (see fig. 5-4)

(2) Range values listed in column I are for 1000 ft. pressure altitude.

(3) For maximum range at any given altitude, use power setting in column farthest to the right.

EXAMPLE

At 130000 lb. gross weight with 6000 gal. of fuel (after deducting total allowances of 340 gal.) to fly 2800 stat. airmiles at 10000 ft. altitude maintain 2250 RPM and 34.9 in. manifold pressure with mixture set: Auto-Rich until Gr. Wt. is reduced to 120,000 lbs. Then use settings in Col. III, fig 5-7

LEGEND

ALT.: Pressure Altitude
M.P.: Manifold Pressure
G.P.H.: U.S. Gal. Per Hour
T.A.S.: True Airspeed
KTS.: Knots
A.R.: Auto-Rich
A.L.: Auto-Lean
S.L.: Sea Level -1000'

DATA AS OF 15 Sept. 1945 BASED ON: XC-97 and B-29A FLIGHT TEST

AIRCRAFT MODEL: YC-97

ENGINE: R-3350-57

FLIGHT OPERATION INSTRUCTION CHART

HOT DAY - NO WIND

CHART WEIGHT LIMITS: 120,000 TO 110,000 POUNDS

EXTERNAL LOAD ITEMS:

NUMBER OF ENGINES OPERATING: FOUR (4)

For details, see power plant chart. Fig. 5-2

LIMITS	R P M	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOT. G.P.H.
WAR EMERG.	2800	52.5	- -	A. R.	5	260	1240
MILITARY POWER	2600	47.5	- -	A. R.	5	260	1200

INSTRUCTIONS FOR USING CHART

Select figure in fuel column equal to or less than amount of fuel to be used for cruising,(1) move horizontally to right or left and select range value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite value nearest desired cruising altitude (ALT.) read RPM, manifold pressure (M.P.) and mixture setting required.

NOTES

APPROXIMATE VALUES FOR REFERENCE { (MI./GAL.) Air miles per gallon (no wind). (G.P.H.) Gallons per hour. (T.A.S.) True airspeed

Range values are for an average airplane flying alone (no wind).(1)

To obtain BRITISH IMPERIAL GAL. (or G.P.H.): multiply U. S. GAL. (or G.P.H.) by 10, then divide by 12. Column I is for emergency high speed cruising only. Columns II, III, IV, V give progressive increase in range at a sacrifice in speed.

Figure 5-7 Flight Operation Instruction Chart 120,000 to 110,000 Pounds Gross Weight

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COLUMN I (2) RANGE IN AIRMILES STATUTE	COLUMN I (2) RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN V (3) RANGE IN AIRMILES STATUTE	COLUMN V (3) RANGE IN AIRMILES NAUTICAL
		6988	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING (1)						6988		
1870	1630	6000	2480	2160	3060	2660	3590	3120	6000	4080	3550
1750	1520	5600	2300	2000	2830	2460	3310	2880	5600	3770	3280
1620	1410	5200	2120	1840	2600	2260	3040	2640	5200	3450	3000
1500	1300	4800	1930	1680	2370	2060	2760	2400	4800	3140	2730
1370	1190	4400	1760	1530	2150	1870	2510	2180	4400	2850	2480
1240	1080	4000	1590	1380	1930	1680	2250	1960	4000	2570	2230
1120	970	3600	1410	1230	1710	1490	2000	1740	3600	2280	1980
990	860	3200	1240	1080	1500	1300	1750	1520	3200	1990	1730
860	750	2800	1080	940	1300	1130	1520	1320	2800	1730	1500
735	640	2400	910	790	1090	950	1290	1120	2400	1470	1275
610	530	2000	750	650	890	775	1060	920	2000	1210	1050

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.375 STAT. (.325 NAUT.) MI./GAL.)						(.43 STAT. (.375 NAUT.) MI./GAL.)						(.52 STAT. (.45 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.		R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.		R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
			(See	Col.	11)	30000	2400	40.3	A. R.	915	348	303													30000						
			(See	Col.	11)	25000	2400	40.2	A. R.	910	337	293													25000						
2400	40.2	A. R.	910	325	283	20000	2370	38.9	A. R.	858	321	279	2250	34.2	A. R.	664	286	249							20000						
2400	40.3	A. R.	915	313	272	15000	2340	37.6	A. R.	812	304	264	2230	33.6	A. R.	650	281	244	2180	32.0	A. L.	489	253	220	15000						
2400	40.6	A. R.	920	299	260	10000	2310	37.0	A. R.	767	286	249	2210	33.6	A. R.	616	266	231	2190	33.2	A. L.	496	257	223	10000	2060	29.3	A. L.	390	230	200
2400	41.2	A. R.	910	288	250	5000	2290	37.0	A. R.	729	273	237	2190	34.0	A. R.	586	253	220	2170	33.4	A. L.	478	247	215	5000	2050	30.2	A. L.	382	225	196
2400	42.0	A. R.	900	276	240	S.L.	2270	37.4	A. R.	687	257	223	2200	35.4	A. L.	500	244	212	2150	34.2	A. L.	455	237	206	S.L.	2000	31.3	A. L.	363	214	186

SPECIAL NOTES

(1) Make allowance for warm-up, take-off and climb (see fig. 5-4)

(2) Range values listed in column I are for 1000 ft. pressure altitude.

(3) For maximum range at any given altitude, use power setting in column farthest to the right.

EXAMPLE

At 120,000 lb. gross weight with 4800 gal. of fuel (after deducting total allowances of 295 gal.) to fly 3140 stat. airmiles at 10,000 ft. altitude maintain 2060 RPM and 29.3 in. manifold pressure with mixture set: Auto-Lean until Gr. Wt. is reduced to 110,000 lbs. then use settings in Col. V, fig. 5-8

LEGEND

ALT.: Pressure Altitude
M.P.: Manifold Pressure
G.P.H.: U.S. Gal. Per Hour
T.A.S.: True Airspeed
KTS.: Knots
A.R.: Auto-Rich
A.L.: Auto-Lean
S.L.: Sea Level - 1000'

DATA AS OF 15 Sept. 1945 BASED ON: XC-97 and B-29A FLIGHT TEST

AIRCRAFT MODEL: YC-97

ENGINE: R-3350-57

FLIGHT OPERATION INSTRUCTION CHART

HOT DAY - NO WIND

CHART WEIGHT LIMITS: 110,000 TO 100,000 POUNDS

EXTERNAL LOAD ITEMS:

NUMBER OF ENGINES OPERATING: FOUR (4)

For details, see power plant chart. Fig. 5-2

LIMITS	R P M	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOT. G.P.H.
WAR EMERG.	2800	52.5	- -	A. R.	5	260	1240
MILITARY POWER	2600	47.5	- -	A. R.	5	260	1200

INSTRUCTIONS FOR USING CHART

Select figure in fuel column equal to or less than amount of fuel to be used for cruising,(1) move horizontally to right or left and select range value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite value nearest desired cruising altitude (**ALT.**) read RPM, manifold pressure (M.P.) and mixture setting required.

NOTES

APPROXIMATE VALUES FOR REFERENCE
- (MI./GAL.) Air miles per gallon (no wind).
- (G.P.H.) Gallons per hour.
- (T.A.S.) True airspeed

(1) Range values are for an average airplane flying alone (no wind).

To obtain BRITISH IMPERIAL GAL. (or G.P.H.): multiply U. S. GAL. (or G.P.H.) by 10, then divide by 12. Column I is for emergency high speed cruising only. Columns II, III, IV, V give progressive increase in range at a sacrifice in speed.

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Figure 5-8. Flight Operation Instruction Chart 110,000 to 100,000 Pounds Gross Weight

COLUMN I (2) RANGE IN AIRMILES STATUTE	COLUMN I (2) RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN V (3) RANGE IN AIRMILES STATUTE	COLUMN V (3) RANGE IN AIRMILES NAUTICAL
		5638	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING(1)						5638		
1510	1310	4800	2070	1800	2600	2260	3040	2640	4800	3460	3010
1380	1200	4400	1890	1640	2370	2060	2760	2400	4400	3140	2735
1250	1090	4000	1700	1480	2140	1860	2480	2160	4000	2830	2460
1030	980	3600	1520	1320	1910	1660	2210	1920	3600	2510	2185
1000	870	3200	1330	1160	1680	1460	1930	1680	3200	2200	1910
865	760	2800	1160	1010	1460	1270	1680	1460	2800	1910	1660
750	650	2400	990	860	1240	1080	1430	1240	2400	1620	1410
620	540	2000	815	710	1020	890	1170	1020	2000	1340	1160
495	430	1600	645	560	805	700	920	800	1600	1050	910
375	325	1200	485	420	610	530	690	600	1200	790	685
250	215	800	310	270	405	350	460	400	800	525	455

MAXIMUM CONTINUOUS RPM	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	(.40 STAT. (.35 NAUT.) MI./GAL.) RPM	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.505 STAT. (.44 NAUT.) MI./GAL.) RPM	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.575 STAT. (.50 NAUT.) MI./GAL.) RPM	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE RPM	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M PH	Approx. T.A.S. KTS.
						40000																			40000						
			(See	Col.	11)	35000	2400	40.4	A. R.	915	367	319													35000						
2400	40.3	A. R.	915	362	315	30000	2390	39.9	A. R.	891	359	312													30000						
2400	40.2	A. R.	910	346	301	25000	2360	38.4	A. R.	840	348	294													25000						
2400	40.2	A. R.	910	331	288	20000	2330	37.2	A. R	794	320	278	2140	30.5	A. R.	531	269	234							20000						
2400	40.3	A. R.	915	320	278	15000	2300	36.2	A. R.	740	301	262	2200	32.6	A. L.	505	272	236	2150	31.7	A. L.	456	263	229	15000						
2400	40.6	A. R.	920	304	264	10000	2280	36.1	A. R.	709	285	248	2200	33.1	A. L.	505	264	230	2140	31.7	A. L.	444	255	222	10000	1950	28.2	A. L.	354	232	202
2400	41.2	A. R.	910	290	252	5000	2250	35.7	A. R.	661	267	232	2200	34.1	A. L.	505	258	224	2110	31.6	A. L.	424	244	212	5000	1800	29.6	A. L.	325	213	185
2400	42.0	A. R.	900	277	241	S.L.	2230	36.2	A. R.	631	254	221	2140	34.0	A. L.	488	247	215	2080	32.6	A. L.	402	231	201	S.L.	1700	31.2	A. L.	304	198	173

SPECIAL NOTES

(1) Make allowance for warm-up, take-off and climb (see fig. 5-4)

(2) Range values listed in column I are for 1000 ft. pressure altitude.

(3) For maximum range at any given altitude, use power setting in column farthest to the right.

EXAMPLE

At 110000 lb. gross weight with 3200 gal. of fuel (after deducting total allowances of 250 gal.) to fly 2200 stat. airmiles at 10000 ft. altitude maintain 1950 RPM and 28.2 in. manifold pressure with mixture set: Auto-Lean until Gr. Wt. is reduced to 100,000 lbs. then use settings in Col. V, fig. 5-9.

LEGEND

ALT.:	Pressure Altitude	KTS.:	Knots
M.P.:	Manifold Pressure	A.R.:	Auto-Rich
G.P.H.:	U.S. Gal. Per Hour	A.L.:	Auto-Lean
T.A.S.:	True Airspeed	S.L.:	Sea Level -1000'

DATA AS OF 15 Sept. 1945 BASED ON: XC-97 and B-29A FLIGHT TEST

AIRCRAFT MODEL: YC-97

ENGINE: R-3350-57

FLIGHT OPERATION INSTRUCTION CHART

HOT DAY - NO WIND

CHART WEIGHT LIMITS: 100,000 TO 90,000 POUNDS

EXTERNAL LOAD ITEMS:

NUMBER OF ENGINES OPERATING: FOUR (4)

For details, see power plant chart. Fig. 5-2

LIMITS	R P M	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOT. G.P.H.
WAR EMERG.	2800	52.5	- -	A. R.	5	260	1240
MILITARY POWER	2600	47.5	- -	A. R.	5	260	1200

INSTRUCTIONS FOR USING CHART

Select figure in fuel column equal to or less than amount of fuel to be used for cruising,[1] move horizontally to right or left and select range value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite value nearest desired cruising altitude (ALT.) read RPM, manifold pressure (M.P.) and mixture setting required.

NOTES

APPROXIMATE VALUES FOR REFERENCE { (MI./GAL.) Air miles per gallon (no wind). (G.P.H.) Gallons per hour. (T.A.S.) True airspeed

[1] Range values are for an average airplane flying alone (no wind).

To obtain BRITISH IMPERIAL GAL. (or G.P.H.): multiply U. S. GAL. (or G.P.H.) by 10, then divide by 12. Column I is for emergency high speed cruising only. Columns II, III, IV, V give progressive increase in range at a sacrifice in speed.

COLUMN I (2) RANGE IN AIRMILES STATUTE	COLUMN I (2) RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN V (3) RANGE IN AIRMILES STATUTE	COLUMN V (3) RANGE IN AIRMILES NAUTICAL
		4800	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						4800		
1390	1210	4400	2050	1780	2550	2220	3020	2620	4400	3450	3000
1270	1100	4000	1840	1600	2300	2000	2720	2360	4000	3110	2700
1140	990	3600	1630	1420	2050	1780	2420	2100	3600	2760	2400
1010	880	3200	1430	1240	1800	1560	2120	1840	3200	2420	2100
885	770	2800	1240	1080	1570	1360	1840	1600	2800	2100	1825
760	660	2400	1060	920	1340	1160	1560	1360	2400	1780	1550
635	550	2000	875	760	1100	960	1290	1120	2000	1470	1275
505	440	1600	690	600	875	760	1010	880	1600	1150	1000
380	330	1200	520	450	655	570	760	660	1200	860	750
250	220	800	345	300	425	380	505	440	800	575	500
125	110	400	175	150	220	190	250	220	400	290	250

Figure 5-9. Flight Operation Instruction Chart 100,000 to 90,000 Pounds Gross Weight

MAXIMUM CONTINUOUS R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	(.43 STAT. (.375 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.55 STAT. (.475 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.63 STAT. (.55 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.
						40000																				40000						
2400	40.4	A. R.	915	386	334	35000	2300	36.4	A. R.	740	348	303														35000						
2400	40.3	A. R.	915	372	323	30000	2350	38.2	A. R.	823	359	312														30000						
2400	40.2	A. R.	910	353	307	25000	2330	37.2	A. R.	784	338	294	2120	30.0	A. R.	516	282	245								25000						
2400	40.2	A. R.	910	339	295	20000	2300	36.1	A. R.	740	322	280	2200	32.4	A. L.	505	285	248	2120	30.1	A. L.	431	273	237		20000	2000	27.0	A. L.	349	253	220
2400	40.3	A. R.	915	323	281	15000	2260	34.7	A. R.	700	301	262	2200	32.6	A. L.	505	282	245	2100	29.7	A. L.	417	266	231		15000	1800	27.3	A. L.	325	236	205
2400	40.6	A. R.	920	307	267	10000	2240	34.6	A. R.	656	283	246	2190	33.1	A. L.	492	269	234	2080	29.9	A. L.	402	254	221		10000	1700	28.0	A. L.	305	221	192
2400	41.2	A. R.	910	292	254	5000	2210	34.3	A. R.	614	265	230	2160	33.2	A. L.	469	257	223	2040	30.2	A. L.	386	238	207		5000	1600	29.6	A. L.	286	207	180
2400	42.0	A. R.	900	280	243	S.L.	2200	35.4	A. L.	500	253	220	2140	34.0	A. L.	448	245	213	1970	31.3	A. L.	354	224	195		S.L.	1500	31.2	A. L.	266	192	167

SPECIAL NOTES

(1) Make allowance for warm-up, take-off and climb (see fig. 5-4)

(2) Range values listed in column I are for 1000 ft. pressure altitude

(3) For maximum range at any given altitude, use power setting in column farthest to the right.

EXAMPLE

At 100000 lb. gross weight with 2800 gal. of fuel (after deducting total allowances of 230 gal.) to fly 2100 stat. airmiles at 10000 ft. altitude maintain 1700 RPM and 28.0 in. manifold pressure with mixture set: Auto-Lean until Gr. Wt. is reduced to 90,000 lbs. then use settings in Col. V fig. 5-10.

LEGEND

ALT.: Pressure Altitude
M.P.: Manifold Pressure
G.P.H.: U.S. Gal. Per Hour
T.A.S.: True Airspeed
KTS.: Knots
A.R.: Auto-Rich
A.L.: Auto-Lean
S.L.: Sea Level -1000'

DATA AS OF 15 Sept. 1945 BASED ON: XC-97 and B-29A FLIGHT TEST

AIRCRAFT MODEL: YC-97

ENGINE: R-3350-57

FLIGHT OPERATION INSTRUCTION CHART

HOT DAY - NO WIND

CHART WEIGHT LIMITS: 90,000 TO 80,000 POUNDS

EXTERNAL LOAD ITEMS:

NUMBER OF ENGINES OPERATING: FOUR (4)

For details, see power plant chart. Fig. 5.2

LIMITS	R P M	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOT. G.P.H.
WAR EMERG.	2800	52.5	- -	A. R.	5	260	1350
MILITARY POWER	2600	47.5	- -	A. R.	5	260	1200

INSTRUCTIONS FOR USING CHART

Select figure in fuel column equal to or less than amount of fuel to be used for cruising,(1) move horizontally to right or left and select range value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite value nearest desired cruising altitude (**ALT.**) read RPM, manifold pressure (M.P.) and mixture setting required.

NOTES

APPROXIMATE VALUES FOR REFERENCE { (MI./GAL.) Air miles per gallon (no wind). (G.P.H.) Gallons per hour. (T.A.S.) True airspeed

(1) Range values are for an average airplane flying alone (no wind). To obtain BRITISH IMPERIAL GAL. (or G.P.H.): multiply U. S. GAL. (or G.P.H.) by 10, then divide by 12. Column I is for emergency high speed cruising only. Columns II, III, IV, V give progressive increase in range at a sacrifice in speed.

Figure 5-10. Flight Operation Instruction Chart 90,000 to 80,000 Pounds Gross Weight

COLUMN I (4) RANGE IN AIRMILES STATUTE	COLUMN I (4) RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U. S. GAL.	COLUMN V (5) RANGE IN AIRMILES STATUTE	COLUMN V (5) RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING(1)								
1010	880	3200	1565	1360	1935	1680	2300	2000	3200	2650	2300
890	770	2800	1360	1180	1680	1460	2000	1740	2800	2300	2000
760	660	2400	1150	1000	1430	1240	1700	1480	2400	1960	1700
635	550	2000	945	820	1175	1020	1400	1220	2000	1610	1400
505	440	1600	740	640	920	800	1110	960	1600	1270	1100
380	330	1200	550	480	690	600	830	720	1200	950	825
250	220	800	370	320	460	400	550	480	800	635	550
125	110	400	185	160	230	200	275	240	400	320	275

MAXIMUM CONTINUOUS R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	(.46 STAT. (.40 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.58 STAT. (.50 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	(.69 STAT. (.60 NAUT.) MI./GAL.) R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R P M	M.P. Inches	Mixture	Approx. Tot. G.P.H.	Approx. T.A.S. M P H	Approx. T.A.S. KTS.
						40000																				40000						
2400	40.4	A. R.	915	396	344	35000	2340	37.6	A. R.	797	377	327														35000						
2400	40.3	A. R.	915	380	330	30000	2310	36.4	A. R.	753	356	309	2120	30.1	A. R.	518	304	264								30000						
2400	40.2	A. R.	910	358	311	25000	2280	35.4	A. R.	707	334	290	2190	32.2	A. L.	504	296	257	2090	29.3	A. L.	410	283	246	25000						
2400	40.2	A. R.	910	343	298	20000	2250	34.2	A. R.	664	314	273	2200	32.4	A. L.	505	294	255	2080	29.0	A. L.	402	278	242	20000	1700[3]	25.6	A. L.	304	242	210
2400	40.3	A. R.	915	327	284	15000	2220	33.2	A. R.	630	297	258	2180	32.0	A. L.	484	285	247	2050	28.2	A. L.	384	266	231	15000	1670[2]	25.7	A. L.	296	235	204
2400	40.6	A. R.	920	311	270	10000	2200	33.1	A. R.	598	280	243	2150	32.0	A. L.	459	270	234	2000	28.7	A. L.	364	251	218	10000	1530	28.0	A. L.	275	219	190
2400	41.2	A. R.	910	295	256	5000	2200	34.1	A. L.	505	265	230	2120	32.2	A. L.	433	255	221	1870	29.6	A. L.	338	234	203	5000	1400	29.2	A. L.	250	199	173
2400	42.0	A. R.	900	282	245	S.L.	2200	35.4	A. L.	500	256	222	2100	33.0	A. L.	412	242	210	1750	31.2	A. L.	314	218	189	S.L.	1400	29.0	A. L.	228	181	157

SPECIAL NOTES

(1) Make allowance for warm-up, take-off and climb (see fig.5-4)
(2) Use 1700 RPM, 27.3" M.P. on Inboard Engines
(3) Use 1800 RPM, 27.0" M.P. on Inboard Engines
(4) Range values listed in column I are for 1000 ft. pressure altitude
(5) For maximum range at any given altitude, use power setting in column farthest to the right.

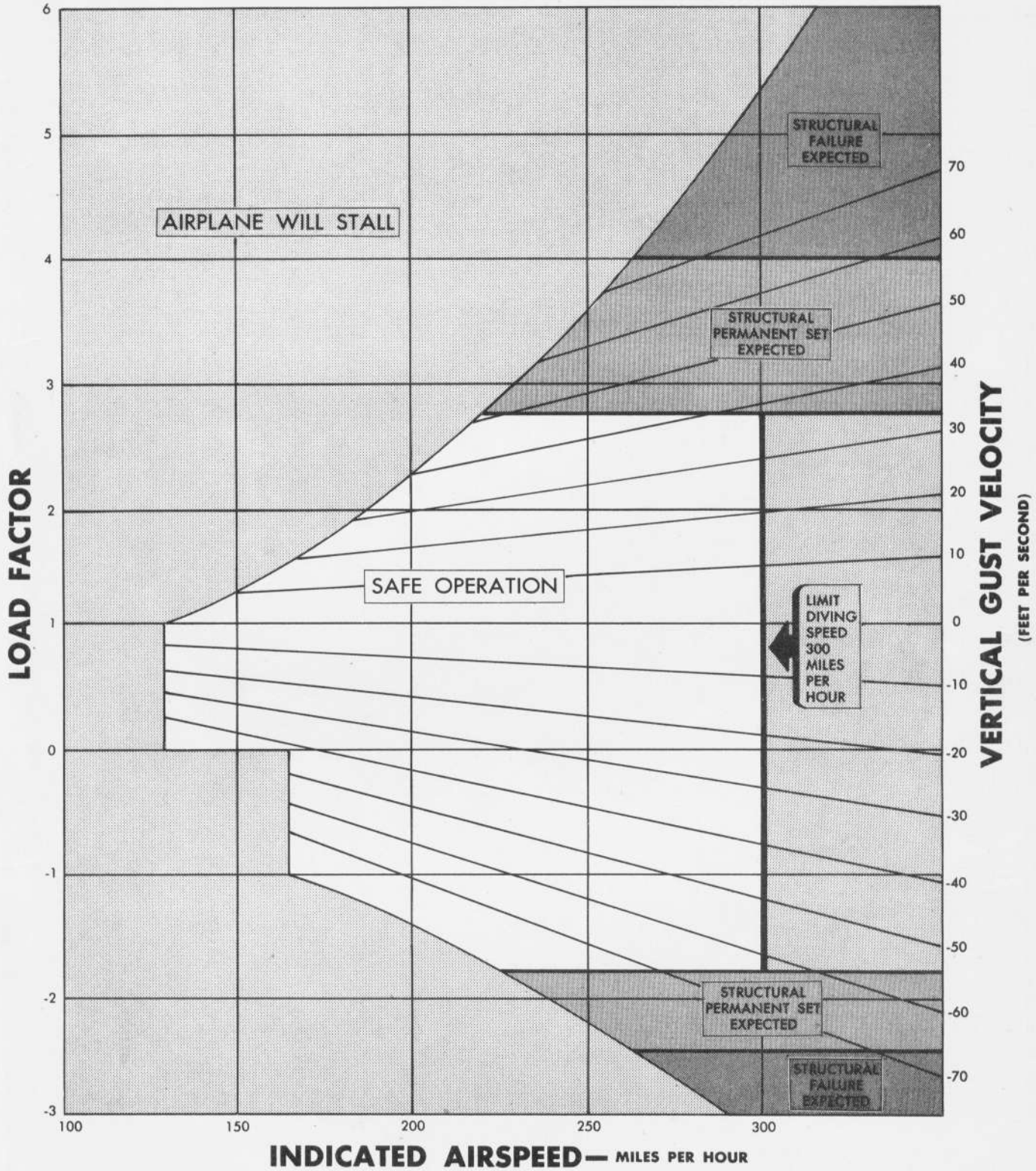
DATA AS OF 15 Sept. 1945 BASED ON: XC-97 and B-29A FLIGHT TEST

EXAMPLE

At 90,000 lb. gross weight with 1200 gal. of fuel (after deducting total allowances of 205 gal.) to fly 950 stat. airmiles at 10,000 ft. altitude maintain 1530 RPM and 28.0 in. manifold pressure with mixture set: Auto-Lean

LEGEND

ALT.: Pressure Altitude
M.P.: Manifold Pressure
G.P.H.: U.S. Gal. Per Hour
T.A.S.: True Airspeed
KTS.: Knots
A.R.: Auto-Rich
A.L.: Auto-Lean
S.L.: Sea Level -1000'



CONDITIONS—

GROSS WEIGHT—120,000 POUNDS
MAXIMUM CARGO WEIGHT— 29,200 POUNDS
FLAPS UP
COMPRESSIBILITY EFFECTS NEGLECTED

Figure 5-11. Load Factor and Vertical Gust vs. Airspeed Curves

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PILOT'S NOTES