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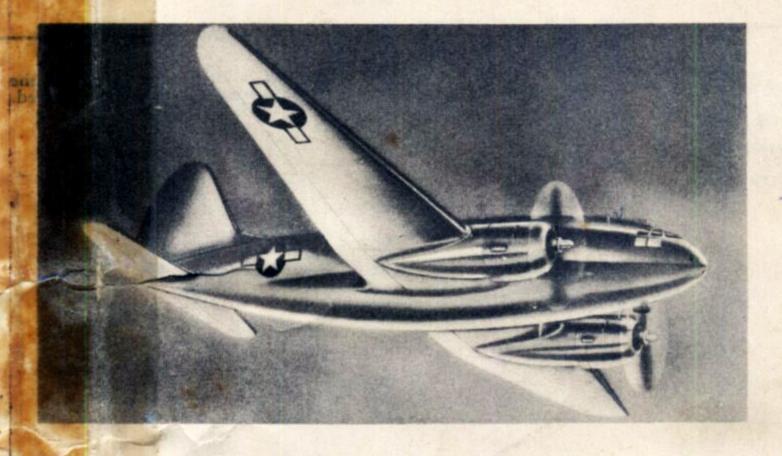
PILOT'S FLIGHT OPERATING
INSTRUCTIONS

FOR

AIRPLANES

A'RMY MODELS C-46, C-46A, C-46D

NAVY MODEL R5C-1



July 1

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C-46 SERIES MODEL DESIGNATIONS

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Series	Block	Factory Sequence	AAF Serial Number
C-46		1-25	AF41-5159 —AF41-5183
C-46A	1CU	26-50	AF41-5184 —AF41-5204
C-46A	5CU	51-100	AF41-12284 —AF41-12333
C-46A	10 CU	101-150	CONTRACTOR OF THE PARTY OF THE
C-46A	15CU	151-200	AF41-12334 —AF41-12383 AF41-12384 —AF41-12433
C-46A	20CU	201-250	AF41-124640 —AF41-124689
C-46A	25CU	251-300	AF41-24690 —AF41-24689
C-46A	30 CU	301-350	AF41-24740 —AF42-3577
C-46A	35CU	351-456	AF42-3578 —AF42-3683
C-46A	40CU	457-700	AF42-5076 —AF42-3085 AF42-60942 —AF42-107373
C-46A	45CU	701-1000	AF42-107374—AF42-107373
C-46D	1CU	701-1000	* AF42-107374—AF42-96802
C-46A	50CU	1001-1375	AF42-96803 —AF44-77443
C-46D	5CU	1001-1375	
C-46A	55CU	1376-1825	* AF42-96803 —AF44-77443
C-46D	10CU	1376-1825	AF44-77444 —AF44-77893
C-46D	15CU	1826-2276	* AF44-77444 AF44-77893 AF44-77894 AF44-78344

ST. LOUIS-LOUISVILLE

Series	Block	Factory Sequence	AAF Serial Number
C-46A	1CK	1-20	AF43-46953 —AF43-46972
C-46A	5CK	21-80	AF43-46973 —AF43-47032
C-46A	55CK	81-200	AF43-47033 —AF43-47152
C-46A	60CK	201-417	AF43-47153 —AF43-47369

^{*} Intermittent serial numbers in this range because these airplanes were modified prior to delivery from corresponding "A" block airplanes.

INTRODUCTION

This Handbook is designed to cover all maintenance instructions from minor adjustments, tests and inspections to major disassembly and repair (except structural repair) for all C-46 series airplanes in the following blocks:

Block No.	AAF Serial Nos.
C-46	AF41-5159 —AF41-5183
C-46A-1-CU	AF41-5184 —AF41-5204
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AF41-12280 —AF41-12283
C-46A-5-CU	AF41-12284 —AF41-12333
C-46A-10-CU	AF41-12334 —AF41-12383
C-46A-15-CU	AF41-12384 —AF41-12433
C-46A-20-CU	AF41-24640 —AF41-24689
C-46A-25-CU	AF41-24690 —AF41-24739
C-46A-30-CU	AF41-24740 —AF41-24775
	AF42-3564 —AF42-3577
C-46A-35-CU	AF42-3578 —AF42-3683
C-46A-40-CU	AF42-60942 —AF42-61091
	AF42-107280—AF42-107373
C-46D-1CU and C-46A-45-CU	AF42-107374—AF42-107399 .
	AF42-96529 —AF42-96802
C-46D-5CU and C-46A-50-CU	AF42-96803 —AF42-96828
	AF42-101036—AF42-101235
	AF44-77295 —AF44-77443
C-46A-55-CU	AF44-77444 —AF44-77446
C-46D-10-CU	AF44-77445 AF44-77447-AF44-77893
C-46A-1CK	AF43-46953 —AF43-46972
C-46A-5CK	AF43-46973 —AF43-47032
C-46A-55CK	AF43-47033 —AF43-47202

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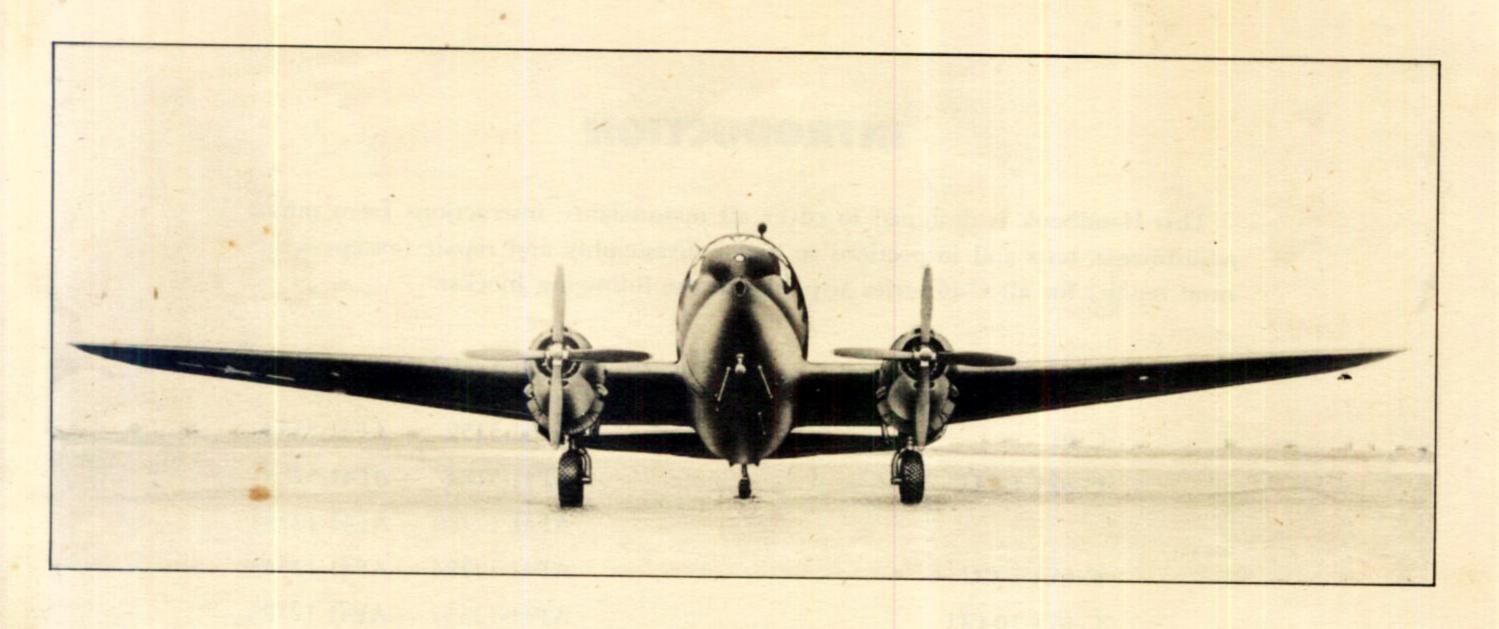


Figure 1-C-46 Airplane-Front View



Figure 2-C-46 Airplane-Front Left View

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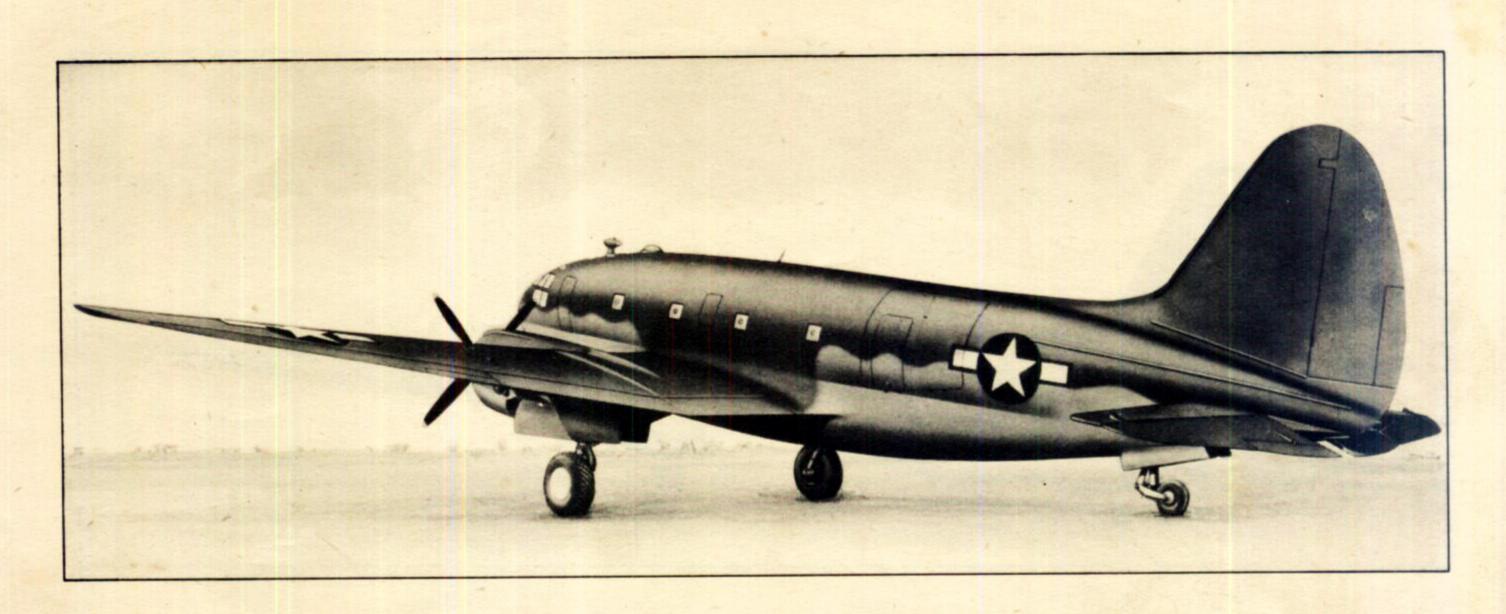


Figure 3—C-46 Airplane—Rear Left View

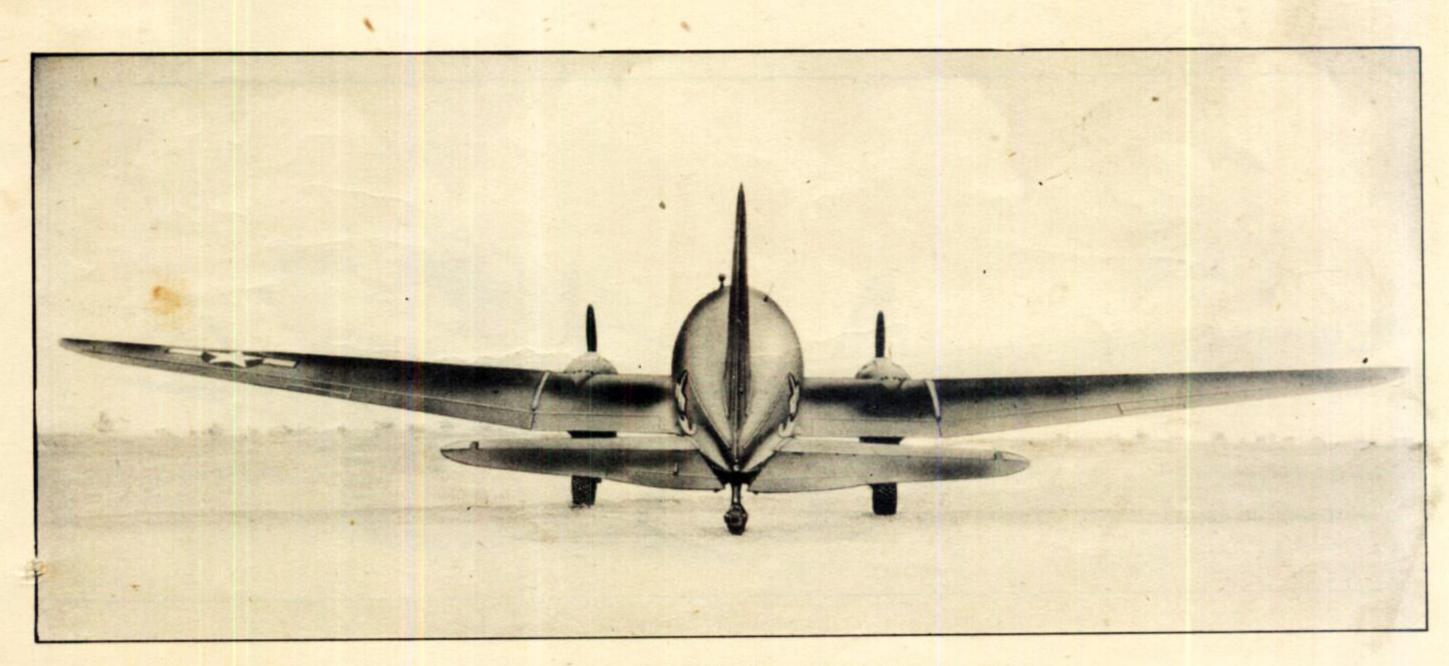


Figure 4-C-46 Airplane-Rear View

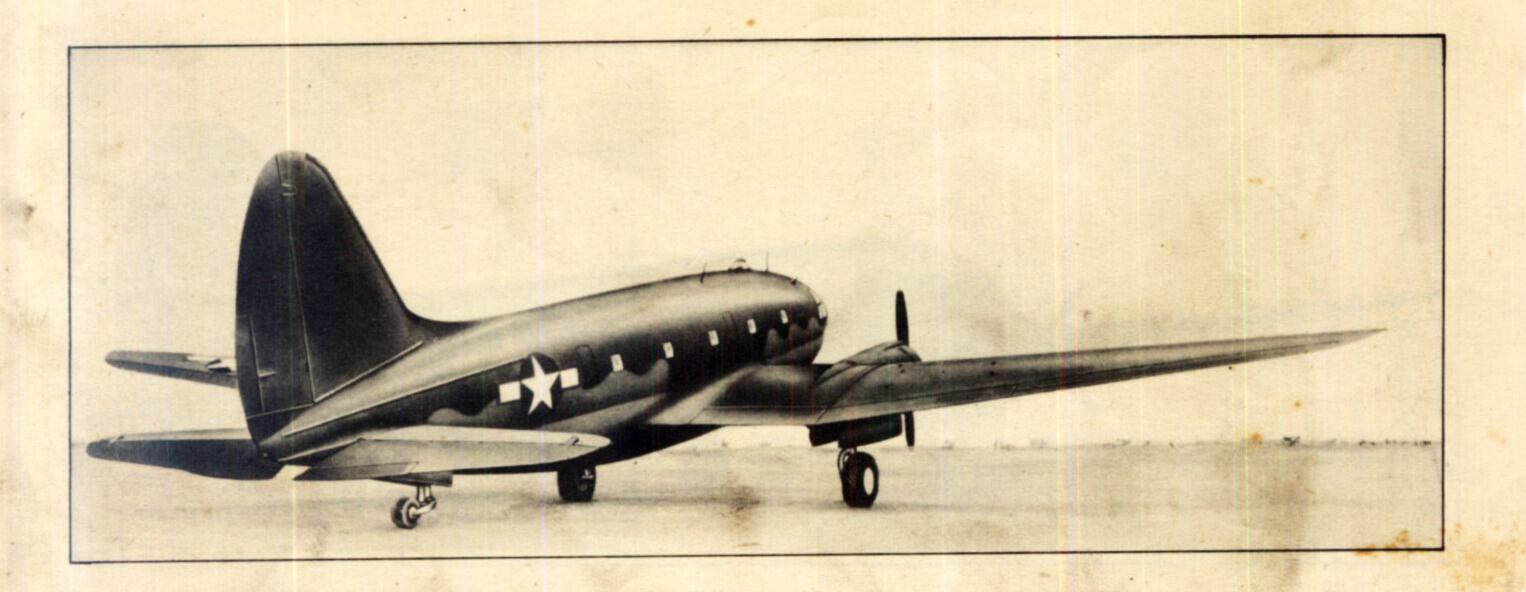


Figure 5—C-46 Airplane—Rear Right View

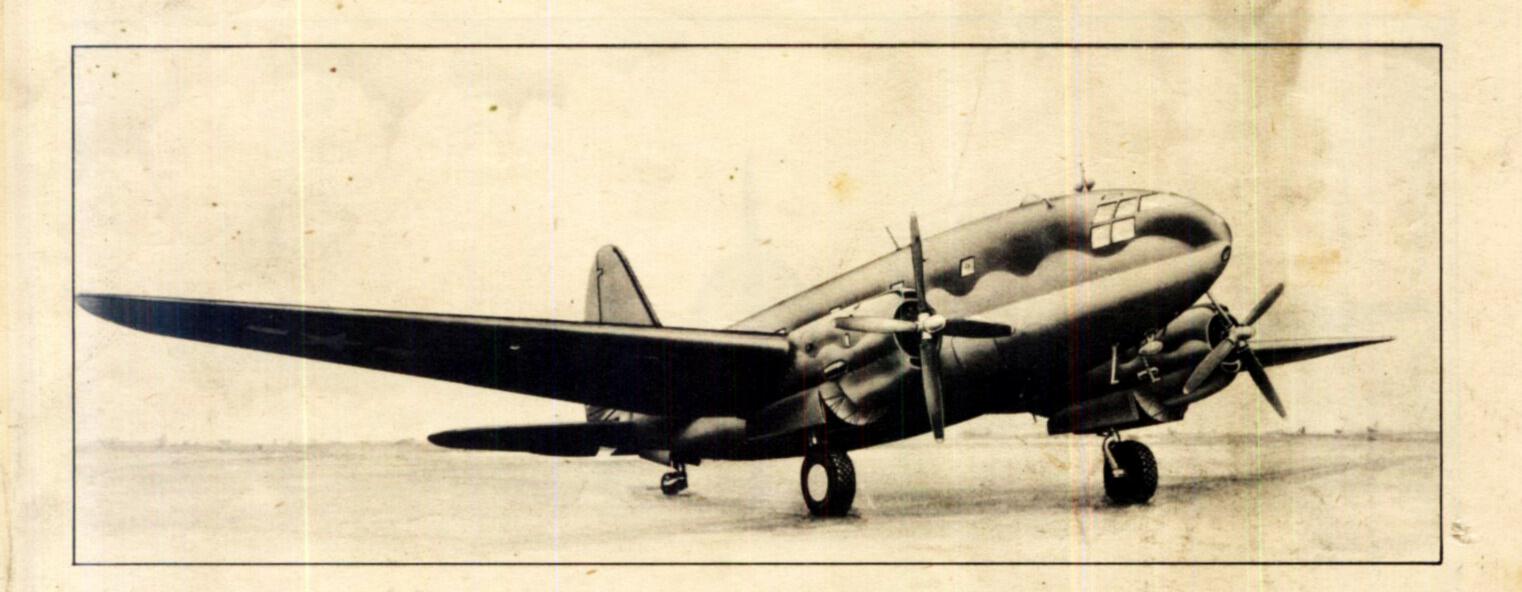
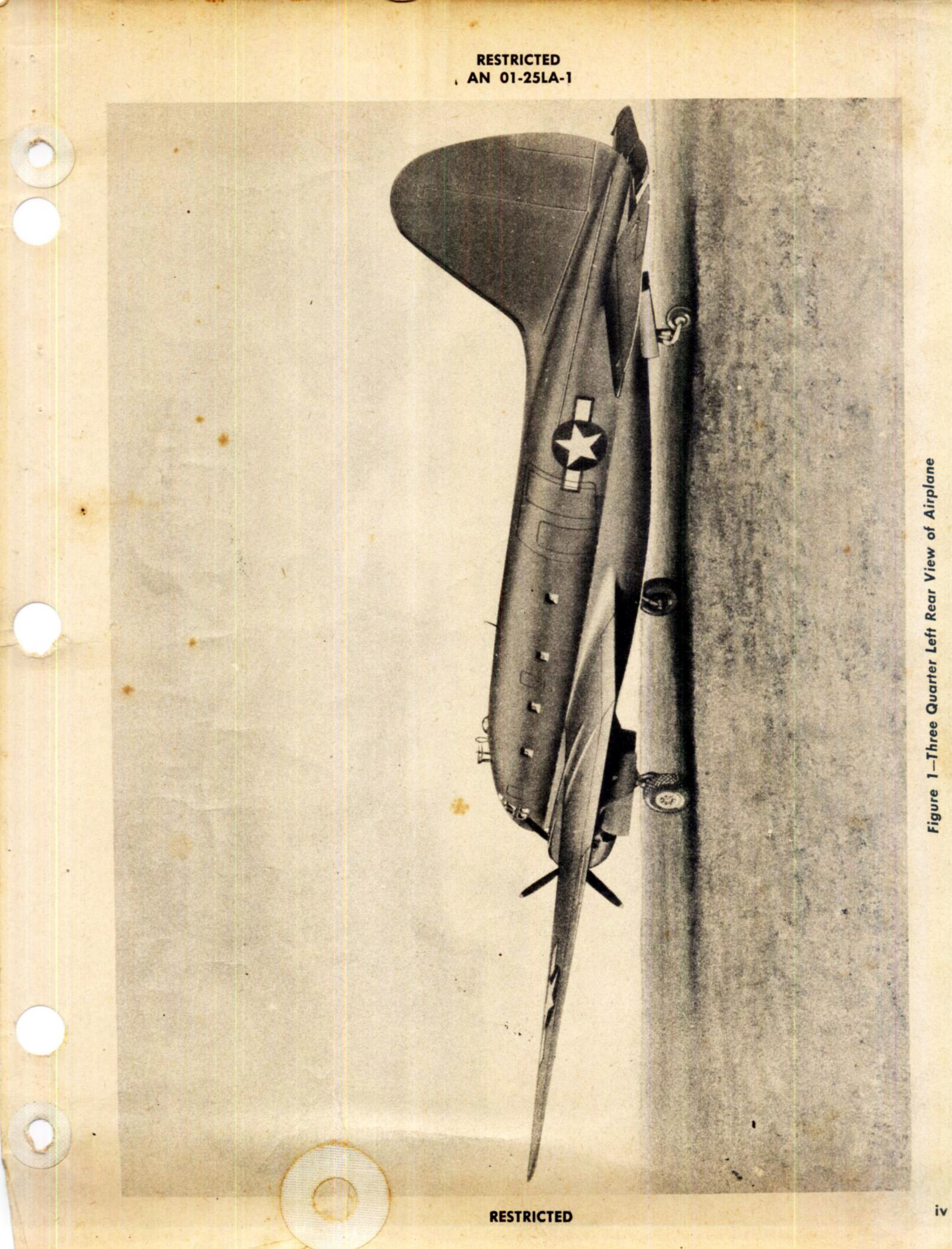


Figure 6-C-46 Airplane-Front Right View







DESCRIPTION

1. AIRPLANE.

The C-46 series (Navy R5C-1) airplane is a twin engined, low-midwing, all-metal, land monoplane. Beginning with the C-46D (airplane AF44-77444) the primary function is paratroop transport.

The overall dimensions of the C-46 airplane are: length, 76 feet, 4 inches; height, at rest 22 feet; and span, 108 feet.

The normal gross weight of the C-46A (Navy R5C-1) and C-46D is 45,000 pounds, and the maximum permissible gross overload is 50,000 pounds.

Each airplane is powered by two Pratt & Whitney R-2800-51 twin row, radial, air-cooled engines. A two-speed, single stage, gear driven supercharger is built integrally into each engine. A Stromberg injection carburetor is installed on each engine.

Seats are provided for the pilot, co-pilot, and radio operator, in the pilots' compartment. The navigator is seated at the forward right side of the main cargo compartment.

2. ENGINE CONTROLS.

- a. THROTTLE CONTROLS.—(See 1, figure 3.)
- b. MIXTURE CONTROLS.—The following positions are available:

"FULL RICH"

"AUTO RICH"

"AUTO LEAN"

"IDLE CUT-OFF"

- c. SUPERCHARGER CONTROLS.—The two-speed ("HIGH" and "LOW") blower is controlled by levers (19, figure 3).
- d. CARBURETOR HEAT CONTROLS.—See 11, figure 3.
- e. CARBURETOR FILTER CONTROL.—See 16, figure 3.
 - f. COWL FLAP CONTROLS.—See 2, figure 3.
- g. FRICTION ADJUSTMENT CONTROLS are provided for locking throttle, mixture, propeller, and cowl flap controls.

3. PROPELLERS.

Hamilton Standard hydromatic, controllable pitch, three bladed propellers are installed on airplanes through AF41-12333. Curtiss Electric, controllable pitch, four bladed propellers are installed on all subsequent airplanes. Both types of propellers incorporate constant speed and full feathering features.

- a. HAMILTON STANDARD PROPELLER CON-TROLS.
- (1) GOVERNOR CONTROLS—(29, figure 3.) These controls alone provide normal constant speed operation. The controls operate in the conventional manner to maintain a desired RPM.
- (2) FEATHERING SWITCHES—(24, figure 3) are pushed to feather.
 - b. CURTISS ELECTRIC PROPELLER CONTROLS.
- (1) GOVERNOR CONTROLS—The governor controls (29, figure 3) are operated in the conventional manner to maintain a desired RPM when the propeller selector switches are in "AUTO" position.
- (2) CIRCUIT BREAKERS—The propeller circuit breakers (23, figure 3), are operated only when the corresponding circuit breaker is in. If the breaker opens because of an overload which is indicated by a luminous red and white band appearing on the push button, it may be reset by holding the button in for a few seconds. The circuit breakers must be in at all times for normal operation.
- (3) SELECTOR SWITCHES—The selector switches (8, figure 3) for the Curtiss propellers have four positions, "AUTO", "FIXED PITCH", "INC RPM", and "DEC RPM". The switches alone may be employed to increase or decrease RPM, to feather the propeller, or to maintain a fixed pitch, at the propeller governor. The switches must be in the "AUTO" position for the governor control to be effective in maintaining a desired RPM. If the governor control becomes inoperative the propeller will operate as a fixed pitch propeller, unless "INC RPM" or "DEC RPM" positions are selected.
- (4) FEATHERING SWITCHES.—The feathering switches (24, figure 3) have two positions, "FEATHER" and "NORMAL."

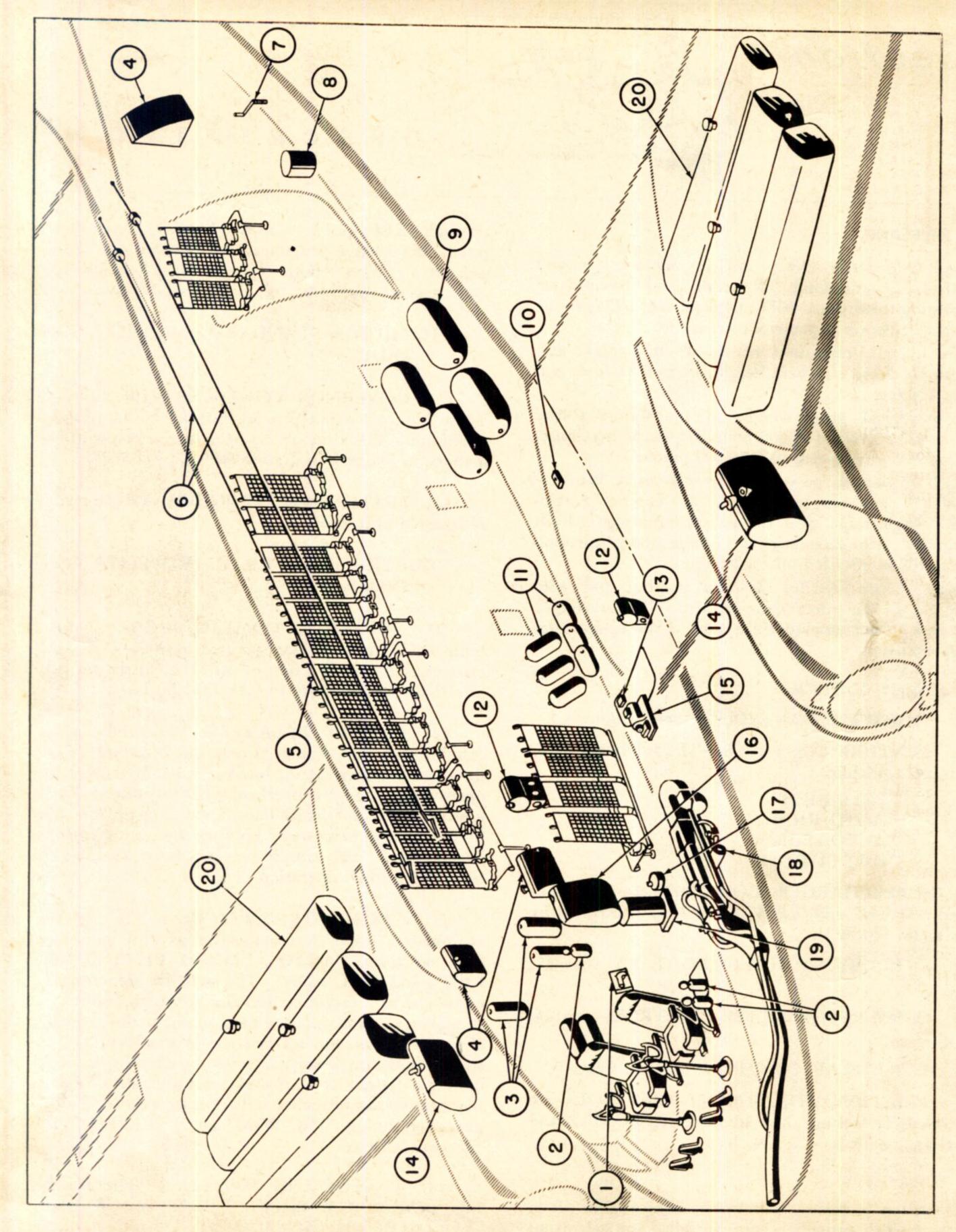


Figure 2-Interior Arrangement Diagram

Key to Figure 2

- 1. Pyrotechnic Pistol
- 2. Oxygen Walk Around Bottles
- 3. Crew Oxygen Cylinders 4. Drinking Water Tank
- 5. Troop Seats
- 6. Static Lines
- 7. Emergency Engine Crank
- 8. Lavatory
- 9. Troop Oxygen Cylinders
- 10. Ground Service Connection
- 11. Crew Oxygen Cylinders
- 12. Anti-Icing Tanks (AF41-12333 and subsequent)
- 13. British power adapter
- 14. Oil Tanks
- 15. Auxiliary Power Plant
- 16. Anti-Icing Tank (AF41-12334 and Subsequent)
- 17. Auxiliary Hydraulic Reservoir
- 18. Heater
- 19. Main Hydraulic Reservoir
- 20. Fuel Tanks

FUEL SYSTEMS.

a. NORMAL FUEL SYSTEM.

- (1) GENERAL.—A separate fuel system is provided for each engine, with a cross-feed between the two systems. The normal fuel supply is carried in six metal fuel tanks, three installed in each wing. The tank capacities for airplanes previous to AF42-96803 are as follows:
- Front tank (No. 1) 244 US (203.2 Imperial) gallons Center tank (No. 2) 285 US (237.4 Imperial) gallons 171 US (142.4 Imperial) gallons Rear tank (No. 3)

The tank capacities for airplanes AF42-96803 and subsequent follow:

Front tank (No. 1) 236 US (196.6 Imperial) gallons Center tank (No. 2) 292 US (243.3 Imperial) gallons 175 US (145.8 Imperial) gallons Rear tank (No. 3)

(2) CONTROLS AND INSTRUMENTS.

- (a) FUEL TANK SELECTOR VALVE CON-TROLS.—Four fuel tank selector valve wheels (8, figure 4, and 11, figure 5), two on each side of the pilots' compartment, permit the selection of fuel from any one tank in each wing. The left and right wheels on both sides of the pilots' compartment are connected in dual, and select left and right wing tanks respectively. The rim of each wheel is marked "OFF", "FRONT", "CEN-TER", and "REAR". The setting of the fuel selector wheel should be determined by the "click and feel" method and not by the position of the control handle pointer.
- (b) CROSS-FEED VALVE CONTROLS.—On all airplanes previous to AF42-96803, except -36 CU and -41 CU airplanes, the cross-feed valve control is located on the left wall of the main cabin at station 276, near the ceiling. The cross-feed valve is located on the suction side of the engine driven pump. With the failure of either pump, the booster pumps must be "ON" to provide fuel to the faulty engine.

On -36 CU and -41 CU airplanes and AF42-96803 and subsequent, the cross-feed valve control is located on the right side of the control pedestal. To open the valve, pull the control knob out.

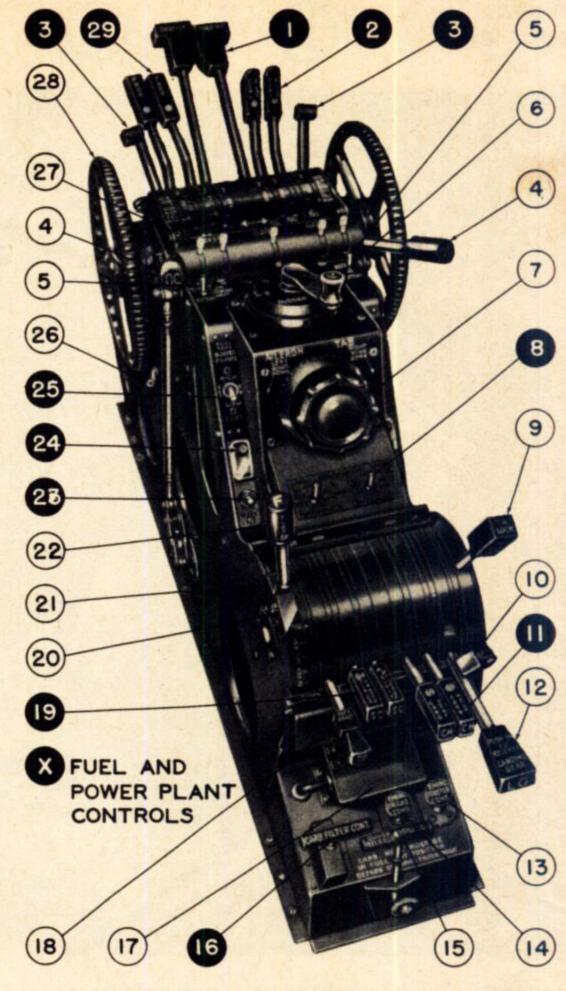


Figure 3—Control Pedestal

Key to Figure 3

- 1. Throttle Controls
- 2. Cowl Flap Controls
- 3. Mixture Controls
- 4. Oil Cooler Flap Controls 5. Landing Light Switches
- 6. Rudder Tab Control
- 7. Aileron Tab Control 8. Curtiss Propeller Selector Switches*
- 9. Tail Wheel Lock Control
- 10. Landing Gear Control Safety Lock
- 11. Carburetor Heat Controls 12. Landing Gear Control
- 13. Emergency Booster Control (Control Surfaces)
- 14. Emergency Brake Control**
- 15. Glider Release Control
- 16. Carburetor Filter Control
- 17. Detonator Switch Buttons
- 18. Parking Brake Control
- 19. Supercharger Controls 20. Flap Control Stop (35° Position)
- 21. Flap Control Stop (15° Position)
- 22. Wing Flap Control
- 23. Propeller Circuit Breaker*
- 24. Propeller Feathering Switch 25. Fuel Booster Pump Selector Switch
- 26. Auxiliary Booster Shut-Off Control (Control Surfaces)**
- 27. Friction Adjustment
- 28. Elevator Tab Control
- 29. Propeller Governor Controls *AF41-12334 and Up

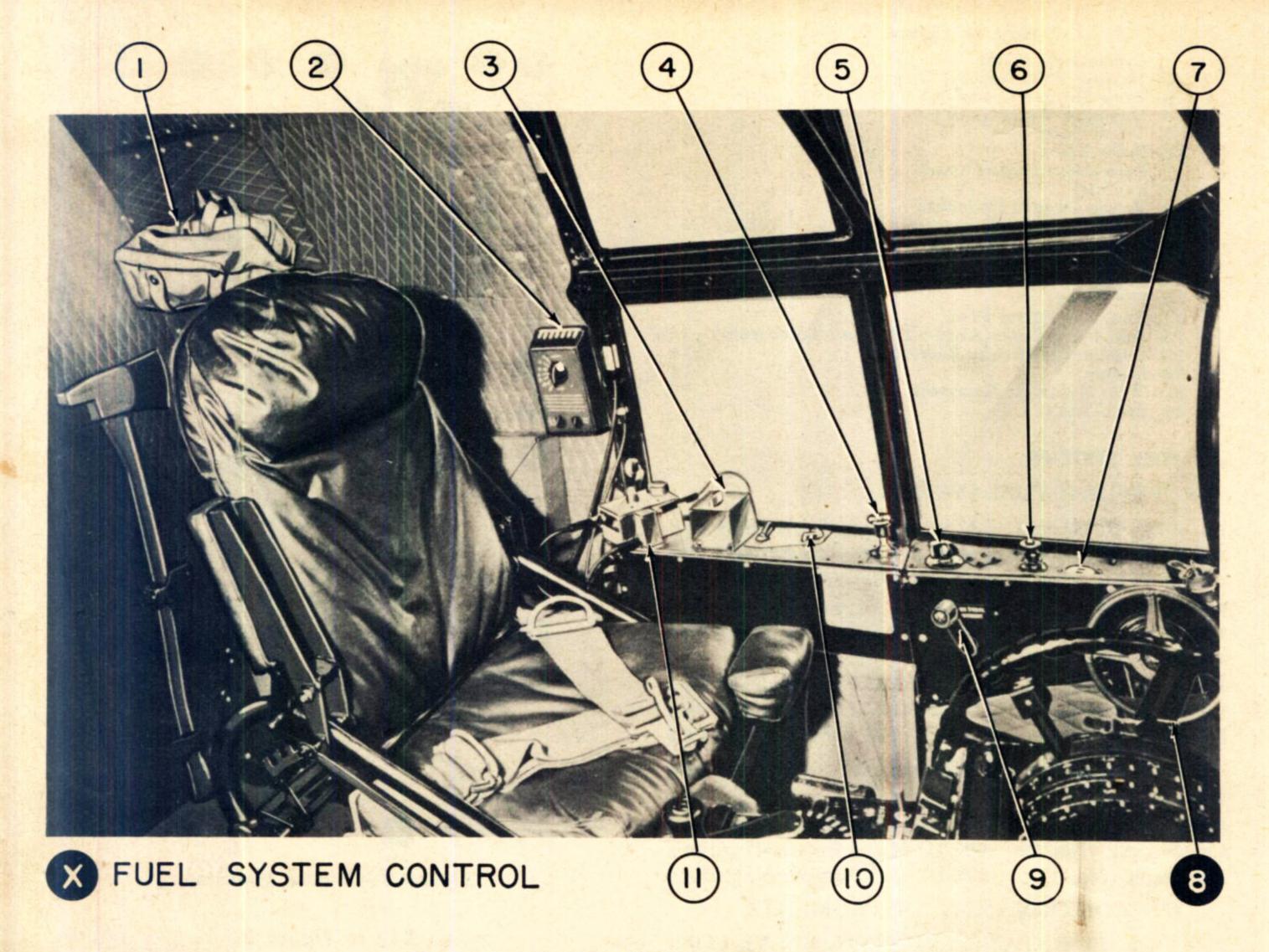


Figure 4—Left Side of Pilots' Compartment

Key to Figure 4

- 1. Signal Pistol
- 2. Heated Suit Control Box
- 3. Radio Filter Switch Box
- 4. Cold Air Valve
- 5. Rheostat (Fluorescent Instrument Lights)
- 6. Windshield Wiper Valve
- On all airplanes through AF42-107373, an electrically-operated fuel booster pump is located in each nacelle and operates in conjunction with the six wing tanks. These pumps deliver fuel at a fixed pressure of approximately 16 psi. The pumps are controlled by two switches (25, figure 3) on the control pedestal located left and right of the aileron tab control. In addition to the nacelle booster pump installations, a submerged centrifugal sump booster pump is installed in each center wing tank of -36 and -41 CU airplanes, and in all wing tanks on airplanes AF42-107374 and up. These sump booster pumps are operated through two circuit breaker switches (5, and 58, figure 7), two rheostat and selector switches (25, figure 3), each of
- 7. Portable Equipment Outlet
- 8. Fuel Tank Selector Valve Control
- 9. Rudder Pedal Adjustment Control
- 10. Pitot Anti-Icer Valve
- 11. Radio Jack Box

which is automatically closed when the corresponding fuel tank selector valve is set to the "CENTER" tank position. By means of the rheostats, the fuel delivery pressure may be varied from 7 to 22 psi.

- (d) PRIMER SWITCHES. Two primer switches (19, and 45, figure 7) are located on the overhead panel.
- (e) FUEL QUANTITY GAGES.—Three dual gages are located on the upper left section of the instrument panel. (See figure 6.)
- (f) FUEL PRESSURE GAGE.—A dual fuel pressure gage is located on the upper right position of the instrument panel. (See figure 6.)

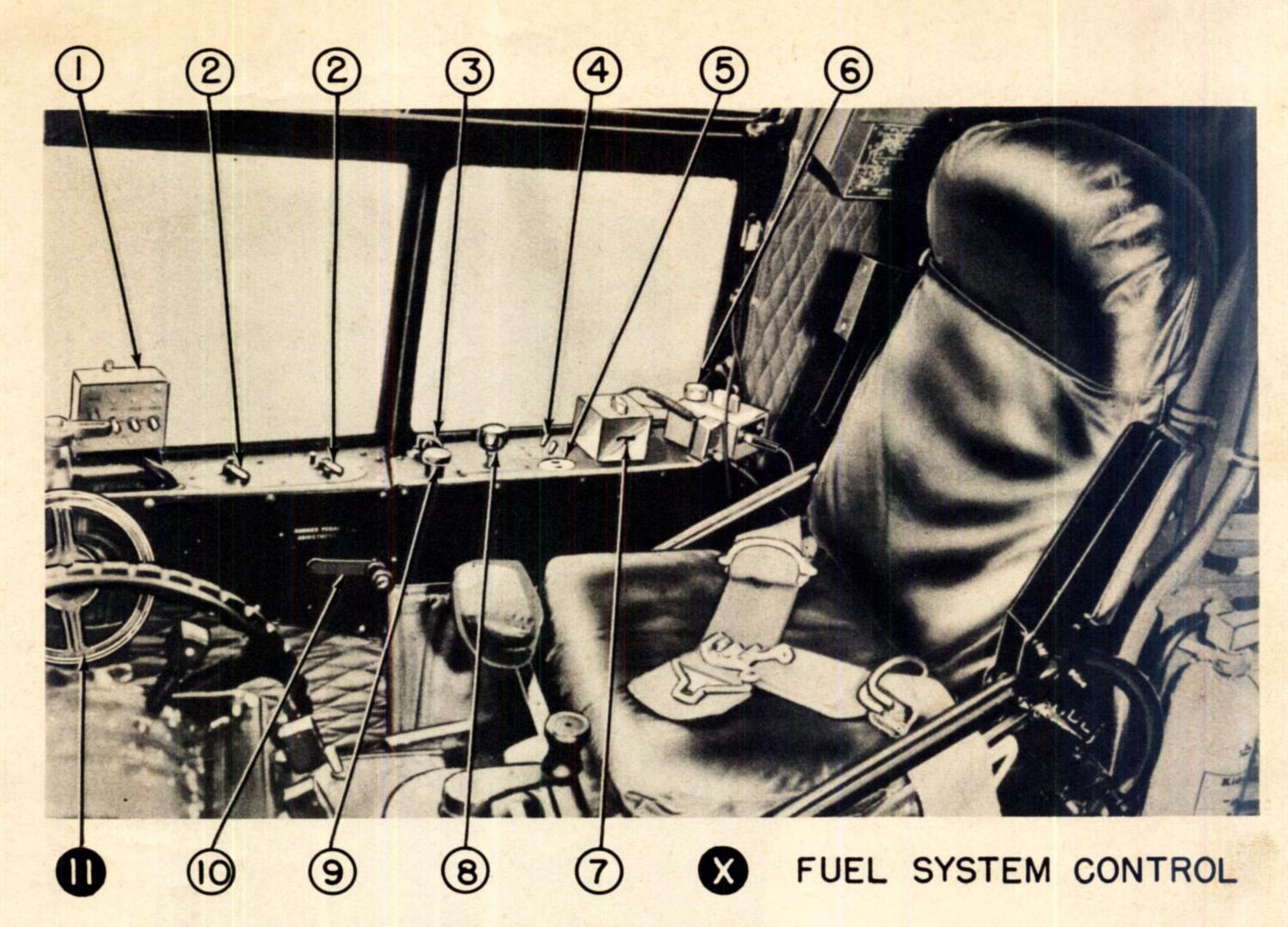


Figure 5-Right Side of Pilots' Compartment

Key to Figure 5

- 1. Recognition Light Switches
- 2. Pitot Blowout Valves
- 3. Rheostat (Fluorescent Instrument Lights)
- 4. Pitot Heater Switches (Left and Right Masts)
- 5. Portable Equipment Outlet
- 6. Interphone Jack Box

(g) FUEL PRESSURE WARNING LIGHT.— A red fuel pressure warning light located on the upper right section of the instrument panel will light when the fuel pressure drops below 14 psi. (See figure 6.)

b. LONG-RANGE FUEL SYSTEM.

(1) GENERAL.—The long-range fuel system consists of removable 100 US (83 Imperial) gallon fuel tanks mounted in pairs in cradles in the main cabin. They may be used in any combination from 2 to 16 tanks. A permanently installed long-range fuel booster pump and strainer are provided. Permanent fuel piping connects the long-range booster pumps to the cross-feed line of the main fuel system through a long-range master shut-off valve.

- 7. Radio Filter Switch Box
- 8. Main Hydraulic Accumulator Shut-off Valve
- 9. Pitot Blowout Pump Control
- 10. Rudder Pedal Adjustment
- 11. Fuel Tank Selector Valve Controls

(2) CONTROLS.

- operations, an eight-tank installation, located on the left side of the fuselage, is used. From the bottom aft end of each tank, a fuel line leads to a shut-off valve. This shut-off valve, at the rear of each tier serves as the shut-off for all tanks in that tier. Therefore, it is possible to supply fuel from either the upper or the lower tier. The master shut-off valve, when closed, shuts off the entire long-range fuel system from the main fuel system. The control for the master shut-off valve is located on the rear of the cradle for the forward left long-range tank.
- (b) FUEL BOOSTER PUMP CONTROL.— The long-range fuel booster pump is permanently installed and is controlled by a switch (3, figure 7).

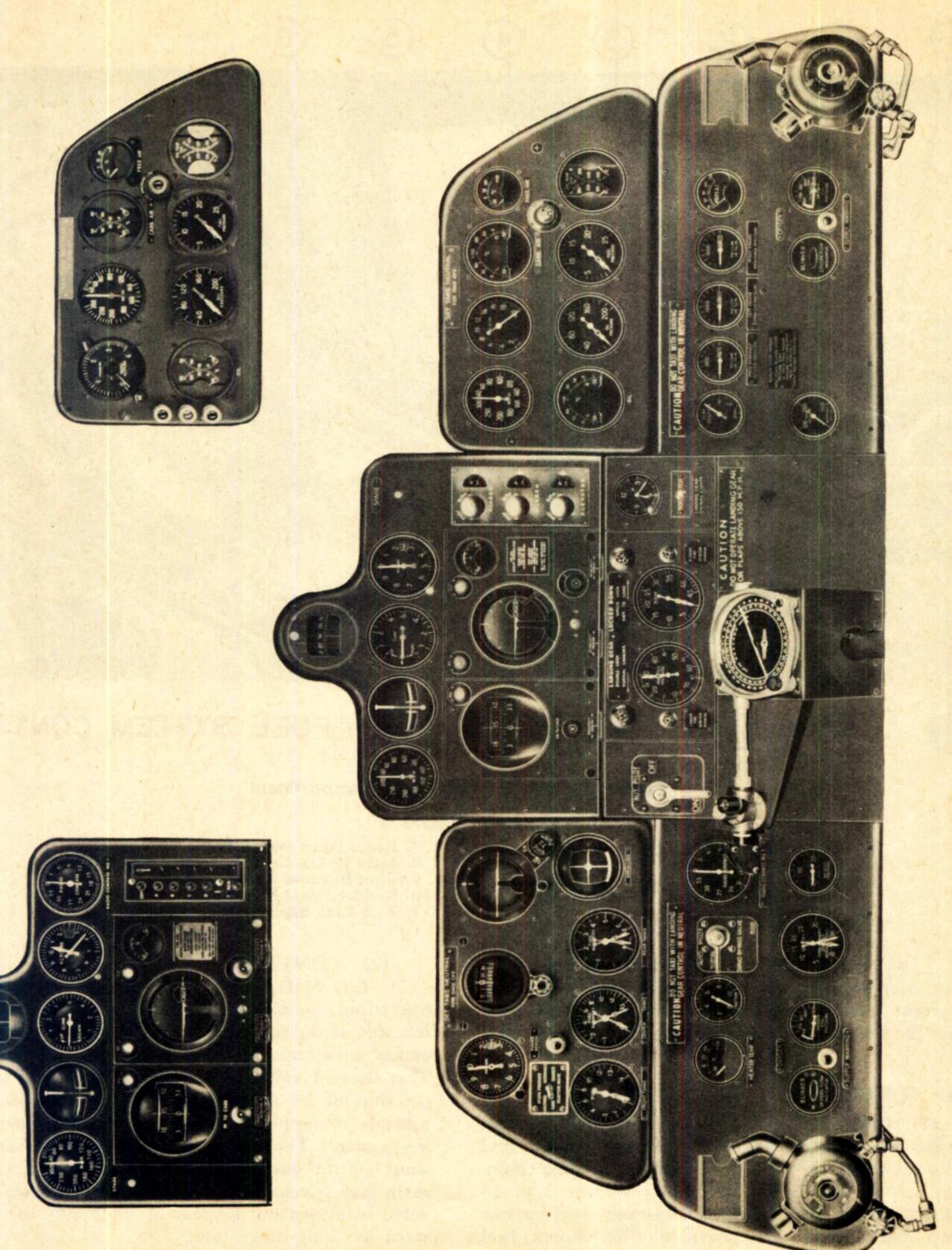
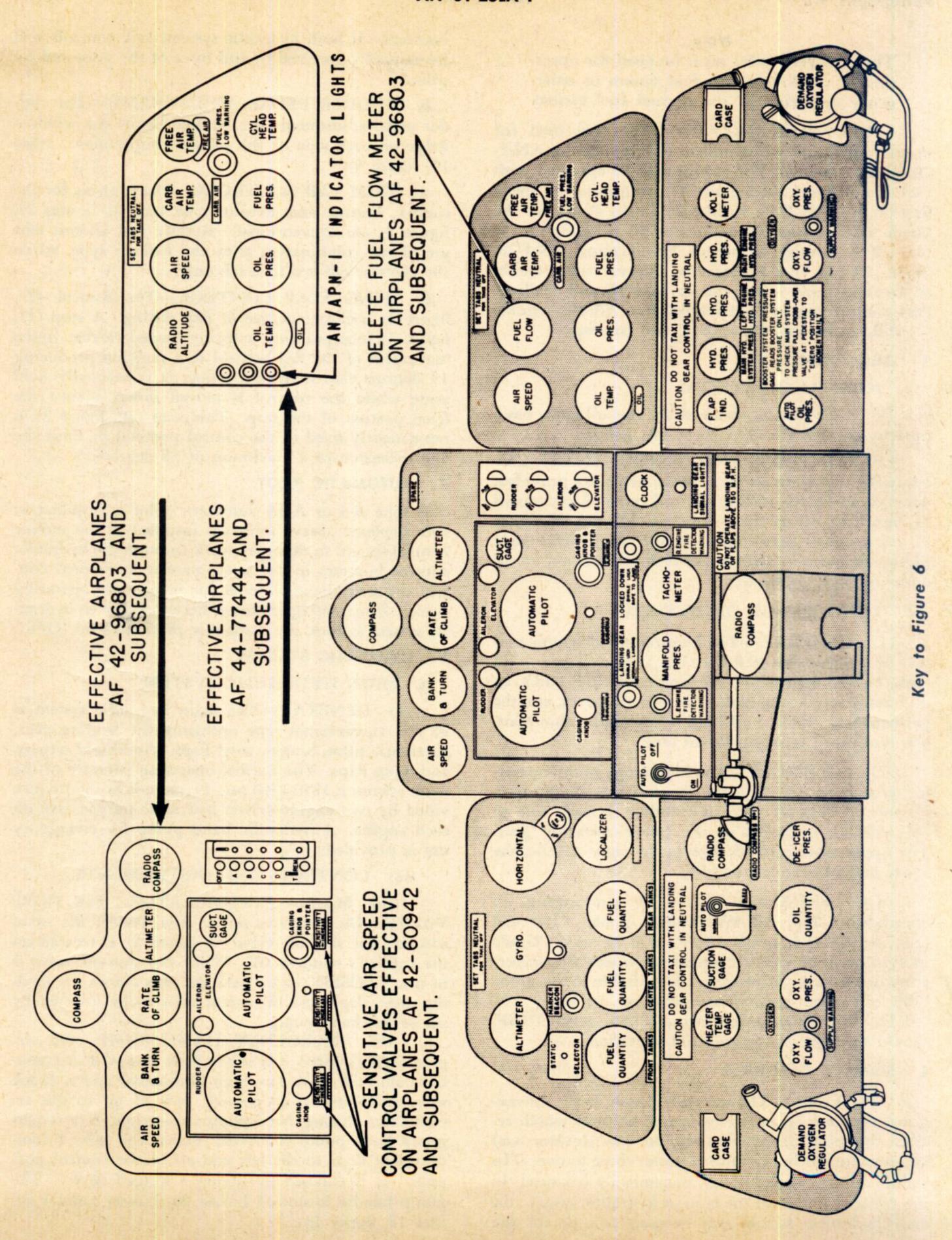


Figure 6-Instrument Panel



Note

The cross-feed valve must be open for operation of the long range fuel system or emergency operation of the normal fuel system.

c. FUEL SPECIFICATIONS.—The fuel used for normal operation will conform to Specification AN-F-28, grade 100/130. The engine may be operated with fuel of not lower than grade 91 conforming to Specification No. AN-F-26, within the limits shown on the Grade 91 Operation Chart, section II, paragraph 1., b. (4). If a limited supply of Specification AN-F-28, grade 100/130, fuel is available, the rear tanks should be serviced with it for use in take-off and landing. Fuel conforming to Specification No. AN-F-26, grade 91, will not be used for take-off and landing.

5. OIL SYSTEM.

a. NORMAL OIL SYSTEM.

- (1) GENERAL.—Each of the two oil tanks has a capacity of 39.8 US (33.1 Imperial) gallons.
- (2) CONTROLS AND INSTRUMENTS.—Conventional oil controls and instruments are provided. They comprise the following: oil cooler flap controls (4, figure 3), oil dilution switches (17, and 46, figure 7), oil pressure gage (figure 6), oil temperature gage (figure 6) and on airplanes AF41-24640 and up, an oil quantity gage (figure 6).

b. LONG RANGE OIL SYSTEM.

- (1) GENERAL.—The long-range oil system consists of a removable 39.8 US (33.1 Imperial) gallon oil tank, located forward of the long-range fuel tanks, an oil hand pump at the tank, two shut-off valves, and the permanently installed oil lines below main cabin floor, one leading to each nacelle oil tank.
- (2) CONTROLS.—The long-range pump operating gear is mounted on the forward side of the tank support. A shut-off valve is installed in each line to the nacelles, outboard of the pump-operating gear. The upper valve controls flow to the right nacelle, the lower valve to the left nacelle.
- c. OIL SPECIFICATION.—Oil conforming to Specification No. AN-VV-O-446A, grades 1100 and 1120, or AN-O-5, grade 1100P, will be used. Grade 1120 oil may be used for operation under all temperature conditions. However, it is desirable to use grade 1100 oil when ground temperatures are below 4°C (40°F). Oil, Specification No. AN-O-5, grade 1100P, should be used for extreme cold operation.

SURFACE CONTROLS.

a. GENERAL.—The control system is of conventional type incorporating hydraulic boosters which reduce the pilot force required on the elevator and aileron controls in the ratio of about three to one. The rudder is both statically and dynamically balanced. In the event of failure of the booster hydraulic system, the main hydraulic system may be used to operate the

boosters. If both hydraulic systems fail, controls will be manually operated by full force of the pilot and copilot.

- b. RUDDER PEDAL ADJUSTMENT.—The rudder pedal adjustments are located below the window ledge on each side of the pilot's compartment. (See 10, figure 5).
- c. TRIM TAB CONTROLS.—The controls for the rudder, aileron, and elevator trim tabs (6, 7, and 28, figure 3) are conventional. Rudder and aileron tabs are of the combination trim and balance type, while the elevator tab is a trim tab only.
- d. WING FLAP CONTROL.—The control (22, figure 3) indicates degree of flap setting. A stop (21, figure 3) incorporating a spring loaded ratchet limits movement of the flap control to a position producing 15 degrees flap extension unless it is manually held aside while the control is moved down against the fixed portion of the stop. This stop (20, figure 3) is permanently fixed to the control pedestal to limit the flap extension to a maximum of 35 degrees.

7. AUTOMATIC PILOT.

A type A-3 or A-3A automatic pilot is installed in this airplane. Servo units are installed in the surface control system so that they work through the hydraulic control boosters in the same manner as manual control and with the same reduction in required operating force. If manual operation is necessary due to hydraulic system failure, the automatic pilot must be "OFF".

8. HYDRAULIC SYSTEMS.

a. MAIN HYDRAULIC SYSTEM.

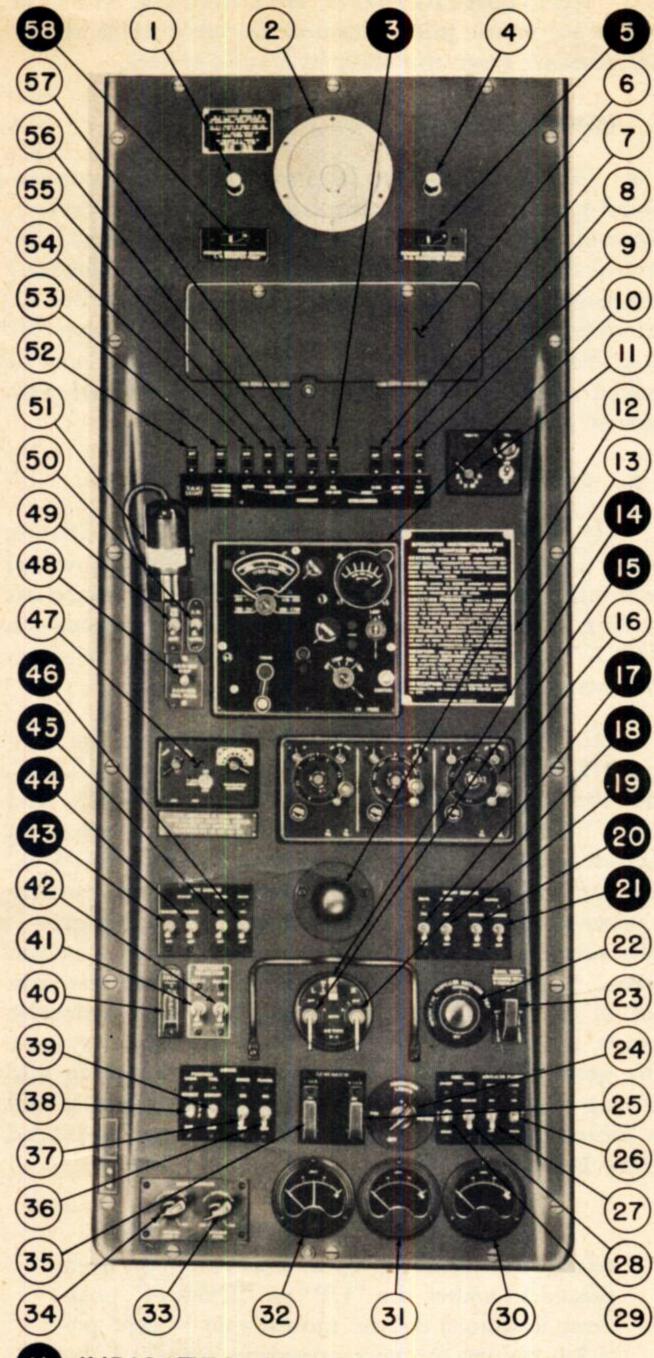
(1) GENERAL.—The main hydraulic system is of the conventional type operating the landing gear, automatic pilot, brakes, cowl flaps, windshield wipers, and wing flaps. The normal operating pressure of the main system is 1250-1300 psi. Pressure is normally provided by two engine-driven hydraulic pumps, one on each engine. A hydraulic hand pump for emergency use is provided.

(2) CONTROLS AND INSTRUMENTS.

(a) MAIN ACCUMULATOR SHUT-OFF VALVE.—On airplanes up to AF42-96803, the main accumulator shut-off valve (8, figure 5) is located on the copilot's window sill. When the shut-off valve is in the "CLOSED" or up position, this allows the landing gear, flaps, and oil cooler flaps to be lowered by use of the hand pump.

(b) EMERGENCY HAND PUMP.—On airplanes AF42-96803 and subsequent the main accumulator shut-off valve has been eliminated and a check valve incorporated to prevent flow of oil to the accumulator during hand-pump operation. The emergency hand pump is located under the pilot's compartment floor to the left and aft of the control pedestal. It is exposed by lifting a hinged cover. The pump handle is stowed below the liaison radio rack. (See 14, figure 13).

RESTRICTED AN 01-25LA-1



NDICATES FUEL AND POWER PLANT CONTROLS

Figure 7—Overhead Panel

Key to Figure 7

- 1. Fixed Resistor for L. H. Booster Pumps
- 2. Cabin Light
- 3. Long Range Fuel Pump Circuit Breaker Switch
- 4. Fixed Resistor for R. H. Booster Pumps

- 5. R. H. Fuel Booster Pump Circuit Breaker Switch
- 6. Overhead Panel Fuse Access Door
- 7. De-Icer Circuit Breaker Switch
- 8. Anti-Icer Pump Circuit Breaker Switch
- 9. Pitot Heater Circuit Breaker Switch
- 10. Radio Compass AN/ARN-7 Control Box
- 11. Localizer Control Box
- 12. Dome Light
- 13. AN/ARN-7 Radio Compass Instruction Plate
- 14. Master Ignition Switch
- 15. Left Engine Ignition Switch
- 16. Command Set SCR-274-N Receivers Control Box
- 17. Right Engine Oil Dilute Switch
- 18. Right Engine Ignition Switch
- 19. Right Engine Primer Switch
- 20. Right Engine Starter Engage Switch
- 21. Right Engine Starter Energize Switch
- 22. Propeller Anti-Icer Pump Rheostat Switch
- 23. Bail Out Warning Bell and Green Light Switch (C-46D only)
- 24. Formation Light Rheostat Switch (C-46D only)
- 25. Right Generator Switch
- 26. Carburetor Anti-Icer Pump Switch
- 27. Pitot Anti-Icer Pump Switch
- 28. Warning Horn Release Switch
- 29. Inverter Selector Switch
- 30. Ammeter, Right Generator
- 31. Ammeter, Left Generator
- 32. Voltmeter
- 33. Overhead Panel Light Rheostat Switch
- 34. Compass Light Rheostat Switch
- 35. Left Generator Switch
- 36. Fluorescent Light Switch
- 37. Dome Light Toggle Switch
- 38. Wing Position Light Switch
- 39. Tail Position Light Switch
- 40. Parapack Salvo Switch (C-46D only)
- 41. "1" Battery Switch
- 42. "2" Battery Switch
- 43. Left Engine Starter Energize Switch
- 44. Left Engine Starter Engage Switch
- 45. Left Engine Primer Switch
- 46. Left Engine Oil Dilute Switch
- 47. Command Set SCR-274-N Transmitter Control Box
- 48. Command Set Audio Switch
- 49. AN/ARR-1 Homing Receiver Switch
- 50. Radio Compass "CW-VOICE" Selector Switch
- 51. Spot Light
- 52. Taxi Lights Circuit Breaker Switch
- 53. Control Booster Heater Circuit Breaker Switch
- 54. Position Light Circuit Breaker Switch
- 55. Passing Light Circuit Breaker Switch
- 56. Cockpit Light Circuit Breaker Switch
- 57. Cabin Light Circuit Breaker Switch
- 58. L. H. Fuel Booster Pump Circuit Breaker Switch

(c) ENGINE PUMP PRESSURE GAGES.— These gages (figure 6) indicate pressure delivered by the respective engine-driven hydraulic pumps. Hydraulic gages will read 650 to 1300 psi.

b. AUXILIARY BOOSTER HYDRAULIC SYSTEM.

(1) GENERAL.—An auxiliary hydraulic booster system for the elevator and aileron controls is installed in all airplanes. On all airplanes, except those prior to AF41-24740 which have not been modified in service, a separate engine-driven pump (on the left engine), reservoir accumulator, and unloading valve are employed to supply booster pressure. On unmodified airplanes prior to AF41-24740, the booster system obtains operating pressure directly from the main hydraulic system. On airplanes having the separate booster system, main system pressure may also be utilized for emergency operation of the boosters by means of an emergency boost control cross-over valve which interconnects the two systems.

(2) CONTROLS AND INSTRUMENTS.

- (a) AUXILIARY BOOSTER SHUT-OFF CONTROL.—This control (26, figure 3) is normally in the "ON" position. In the "OFF" position, it shuts off hydraulic operating pressure to the booster cylinders, returning the surface controls to the full manual operating condition.
- (b) EMERGENCY BOOSTER CONTROL.—
 The primary purpose of this control (13, figure 3) is to permit use of the main hydraulic system as a pressure source for the booster system in the event of failure of the booster pressure supply system. Since the hydraulic system pressure gage on the instrument panel is connected into the auxiliary booster hydraulic system and thus normally indicates booster system pressure, a secondary purpose of the emergency booster control is to allow reading of main system pressure on this gage. The control should be operated, either to obtain emergency pressure for the booster system or to read main system pressure, by pulling the control "UP".

(c) HYDRAULIC SYSTEM PRESSURE INDICATORS.

- 1. The main pressure indicator is normally operated by booster system pressure. However, when the emergency booster valve is "OPEN" the indicator will read main system pressure.
- 2. The left and right engine indicators show the output pressure of the respective pumps. The high pressure shown during the unloading cycle is the pressure in the main system.

c. AUTOMATIC PILOT HYDRAULIC SYSTEM.

—The automatic pilot hydraulic system obtains operating pressure from the main hydraulic system.

9. LANDING GEAR.

a. GENERAL.—The landing gear is of conventional type. All three units are completely retractable. Normal retraction and extension is accomplished hydraulically through one selector valve. Emergency extension may be accomplished manually. Latches are provided to lock the landing gear units in either the extended or retracted position. The tail wheel may be locked with the tread line in a direct fore and aft position or unlocked to allow it to swivel freely.

b. CONTROLS AND INSTRUMENTS.

- (1) TAIL WHEEL LOCK CONTROL. (See 9, figure 3).—This control will engage the tail wheel lock when the tail wheel attains the direct fore-and-aft trailing position. The control will be placed in "LOCK" position, prior to take-off, landing, and retraction of the tail gear.
- (2) LANDING GEAR CONTROLS.—The control (12, figure 3) is marked "LANDING GEAR", and the pedestal is marked "UP", "DOWN", and "NEUTRAL". The gear is retracted, by first releasing the safety latch that holds the control in the "DOWN" position; and pushing the control in and moving it upward to the full "UP" position. After the gear is fully retracted and locked, the control is pushed in and moved to the "NEUTRAL" position. When the control is in "NEUTRAL", the landing gear hydraulic system is locked off from the main hydraulic system. The gear is extended by pushing the control in and moving it to the full "DOWN" position, where it will be locked in place automatically by the spring-loaded safety latch.

CAUTION

After the landing gear control has been placed in either the "UP" or "DOWN" position, it should not be moved out of that position before the corresponding travel of the gear has been completed.

(3) EMERGENCY MANUAL EXTENSION CONTROLS.—An emergency up-latch release and a manually operated extension mechanism are provided for emergency extension of the main landing gear. The emergency up-latch release control (2, figure 13) is located on the floor of the pilots' compartment below the liaison radio rack. To release the up-latch, the control is pulled up (about 850 psi hydraulic pressure). The control incorporates a ratchet device to retain it in the released position while the manual extension mechanism is being operated. The up-latch release also operates three dump valves which vent hydraulic fluid from the retracting struts overboard. The crank for

the manual extension mechanism is stowed on the lower surface of the hatch under the pilots' compartment floor. (See 12, figure 13).

- (4) LANDING GEAR WARNING HORN.—
 The warning horn is mounted on the top of the radio rack in the pilots' compartment at the right of the spare bulb box. The warning system is so arranged that the horn will sound when manifold pressure is below 15 to 18 in. Hg and the main landing gear or tail gear is not down and locked. The sounding of the warning horn may be stopped by holding the horn release switch (28, figure 7) on the overhead panel in the "RELEASE" position.
- (5) LANDING GEAR SIGNAL LIGHTS.—Two signal lights (figure 6) are located on the lower center instrument panel, green to left and amber to the right. These lights indicate the degree of locking of the landing gear in the down position. Two distinct phases of down-locking are indicated. The first or "SINGLE" lock under which condition it is not safe to land (but landing may be attempted at pilot's discretion) is indicated by the amber light. The second or "DOUBLE" lock under which condition a normal landing is made, is indicated by the green light. The lights will not operate if either main landing gear or the tail gear is not fully extended and locked in one of the two positions. A momentary switch is located near the signal lights to check their operation. To check, the switch is held in the "ON" position. If the green and amber lights glow, the system is operating normally.

10. BRAKE SYSTEM.

a. GENERAL.—The wheels of the main landing gear are equipped with expander brakes. The brake systems for the two wheels are entirely independent of each other. The brakes are controlled through conventional treadle-type rudder pedals and are operated by pressure obtained from the main hydraulic system.

b. CONTROLS.

- (1) SERVICE BRAKES.—The service brake controls consist of dual installations of conventional rudder toe pedals.
- (2) EMERGENCY BRAKE CONTROL.—The emergency brake control permits isolation of the hydraulic hand pump from the main system and allows it to work directly into the brake system. To charge the brake accumulator or for emergency operation of the brakes, the control is pulled up and turned to lock; then the hydraulic hand pump is operated as required to obtain braking pressure.
- (3) PARKING BRAKE CONTROL.—This control (18, figure 3) is conventional.

11. ELECTRICAL SYSTEM.

- a. GENERAL.—This airplane has a twin engine 24-volt generator battery system incorporating an inverter system to supply 26-volt ac and 115-volt ac current. It also has an auxiliary power unit to supply current to the batteries and airplane while the airplane is on the ground. An external source of power may be plugged in by means of an external power receptacle located on the right lower side of the fuselage near the ground service door. The internal illumination of the airplane is accomplished by fluorescent and 24-volt dc bulbs.
- b. MAIN POWER CIRCUIT.—The system is made up of two 24-volt generators with a capacity of 200 amps each, located on the accessory section of each engine. Each of these generators is electrically connected to two reverse current relays which are located in the firewall junction box. These reverse current relays are adjusted to cut the batteries into the circuit at 26.5 volts. Also located in the firewall junction box is a 250-amp. overload thermo circuit breaker. To control the voltage of the generators, located in the pilot's accessory compartment, there are two voltage regulators which are adjusted to maintain a constant voltage of 28 volts. Also located in the pilot's accessory compartment are two 24-volt batteries. The charging current to the battery is controlled by two selector switches (41, and 42, figure 7). On airplanes prior to AF42-96802, the battery circuit is safetied through the master ignition switch. On airplanes AF-42-96803 and up, the battery circuit has been removed from the master ignition switch and a jumper wire has been installed. In conjunction with the main power circuit, there are two ammeters (30, and 31, figure 7) and one voltmeter (32, figure 7). The two ammeters indicate the amount of current being supplied by the generators. The voltmeter will always indicate the maximum voltage being supplied.
- c. STARTER SYSTEM.—Each engine is equipped with an electric combination inertia and direct cranking starter, controlled by switches (20, 21, 43, and 44, figure 7) installed on the overhead panel. The "ENGAGE" position automatically energizes the booster coil or induction vibrator to supply starting ignition.

Note

On airplanes AF41-12284 and up, two individual switches are installed for "ENER-GIZE" and "ENGAGE" for each engine. On airplanes prior to AF41-12384, only one switch is installed for each engine.

- d. LIGHTING CIRCUIT.—The following are the lights provided and other details of this circuit.
- (1) Passing lights are controlled by a circuit breaker switch (55, figure 7).

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- (2) Position lights are controlled by a circuit breaker switch (54, figure 7), and two switches (38, and 39, figure 7).
- (3) Cockpit lights other than fluorescent are controlled by a circuit breaker switch (56, figure 7), a dome light toggle switch (37, figure 7), and a rheostat switch (33, figure 7). The fluorescent lights are controlled by a toggle switch (36, figure 7) and a rheostat (3, figure 5) on the copilot's window sill.
- (4) Landing light control switches (5, figure 3) are furnished.
- (5) Taxi light circuit breaker switches (52, figure 7) are furnished, beginning on airplanes AF44-77444 and up.
- (6) Formation lights are furnished on airplanes AF44-77444 and up. They are controlled by a rheostat switch (24, figure 7).
- (7) Cabin lights are furnished and are controlled by a circuit breaker switch (57, figure 7).
- (8) Lower forward cargo compartment lights are controlled by two toggle switches connected in parallel, allowing control by either switch. One light is located on the upper left side of the lower forward cargo compartment door. The other light is just below the pilot's hatch on the right side.
- (9) Lower rear cargo compartment lights are controlled by a toggle switch located on the left side of the door.
- e. ELECTRICAL INSTRUMENTS.—The following instruments are operated on dc:

Outside air temperature gage
Oil temperature gage
Carburetor air temperature gage
Flap indicator
Heater temperature gage
Liquidometer type fuel indicators (on airplanes AF42-96803 and up)

The following instruments operate on ac:

Oil quantity gage
Autosyn type fuel gage (on airplanes
AF41-5159 to AF42-96802)
Compass light

f. INVERTER CIRCUIT.—The inverter system consists of two inverters located under the pilots' floor which are controlled by a switch (29, figure 7). The "MAIN" inverter is to be used for all normal operation, and "SPARE" inverter only on failure of "MAIN" inverter. The output of the inverters is measured by an a-c voltmeter located on copilot's lower instrument panel. The normal setting of the inverters is 115 volts with a minimum of 110 volts and a maximum of 130 volts. This is controlled by a governor which regulates the output. The given figures are with an input voltage

of 28 volts dc. The voltage from the inverters is divided into two systems, one system being 26 volts ac, which is used for the compass ring light and autosyn instruments, and the other circuit is 115 volts ac. The heater ignition and some radio equipment is operated from this system.

g. AUXILIARY POWER CIRCUIT.—The auxiliary power unit is a single cylinder, air cooled, two-cycle gasoline engine. This engine is connected to a dc generator of 2000 watt output at 28 volts and 70 amps. The unit is located in the lower forward cargo compartment. A voltage regulator is mounted directly on the generator. The setting of the regulator is 28 volts as indicated on the voltmeter mounted on the unit. The unit can be started with the airplane batteries, or manually by a rope.

b. GENERAL ACCESSORIES.

- (1) PITOT HEATERS.—Pitot head heaters are operated by placing circuit breaker switch (9, figure 7) and pitot heater switches (4, figure 5) "ON".
- (2) SURFACE CONTROL BOOSTER HEAT-ERS.—To operate, circuit breaker switch (53, figure 7) must be "ON".
- (3) DE-ICER SYSTEM.—To operate distributor valve, the circuit breaker switch (7, figure 7) must be "ON".
- (4) ANTI-ICER PUMPS.—To operate either pump, the circuit breaker switch (8, figure 7) must be "ON" as well as the appropriate switches (22, 26, and 27, figure 7).
- (5) MISCELLANEOUS OUTLETS.—A power outlet for use of a portable signal lamp or other similar equipment is installed on the forward end of the right and left equipment shelves (see 7, figure 4) and (5, figure 5). These outlets are energized whenever the power system is "ON".

12. MISCELLANEOUS EQUIPMENT AND PROVISIONS.

a. PITOT BLOWOUT VALVE CONTROLS AND PUMPS.—Pitot blow-out valves (2, figure 5) and pitot blow-out pump control (9, figure 5) are installed on the copilot's sill, for clearing clogged airspeed lines. The pump is operated by placing the valve control in "BLOW-OUT PUMP" position and operating the pump with a vertical reciprocating motion. At all other times the valve control is to be placed in "IN-STRUMENT" position. Turning pitot blowout to "PUMP" or "ON", the valve is pushed down and the needle on the airspeed indicator should stay at about 120-150 MPH for about 2 minutes to test for leaks.

CAUTION

When moving valve handles from one position to another ("INSTRUMENT" to "BLOW-OUT PUMP" and vice versa), the valve should be turned SLOWLY through the red section that is indicated on the sill.

- b. BLIND FLYING HOOD.—A blind flying hood can be stowed back of the pilot's seat.
- c. GLIDER TOW RELEASE.—A glider tow release mechanism, installed in the tail is controlled by a release handle (15, figure 3) located at the base of the control pedestal. On C-46D airplanes, the tow rope may be attached or released on the ground from either the pilot's compartment or from the tail cone.
- d. SURFACE CONTROL LOCKS.—Tie-down harnesses and surface-locking frames are provided respectively for locking of the surface controls and control
 surfaces. The tie-down harnesses are stowed in the
 pilot-copilot utility pouch. The surface locking
 frames are stowed in the rear of the main cabin.
- e. MOORING KITS.—Two mooring kits are stowed in the lower forward cargo compartment.
 - f. CARGO PROVISIONS AND EQUIPMENT.
- (1) GENERAL CARGO PROVISIONS.—Loading access to the main cabin is gained through the main cargo door on the left side of the airplane. The limiting dimensions for the cargo door are: 95.5 inches wide, 78.5 inches high at the forward end, and

- 65.5 inches high at the aft end. Two lower cargo compartments are provided. Screens are installed in the lower compartments to prevent cargo from fouling the controls.
- (2) LOADING.—All C-46A (Navy R5C-1) and C-46D airplanes may be loaded to a normal gross weight of 45,000 pounds or to a maximum allowable gross weight of 50,000 pounds. Loading will be in accordance with the load adjuster and the Weight and Balance Handbook AN 01-1B-40, furnished with each airplane. Reference should also be made to the Basic Weight Check List and Loading Data AN 01-25LA-5.

(3) TASK FORCE EQUIPMENT.

- (a) PERSONNEL.—Forty seats for the transportation of troops are installed along each side of the fuselage and a single row of seats may be placed along the center line of the fuselage to accommodate additional troops.
- (b) EQUIPMENT.—Any combination of two of the following may be carried: 4 x 4 truck, 37 mm gun, 75 mm gun, 75 mm howitzer, or a 105 mm howitzer.
- (c) AMBULANCE EQUIPMENT.—Hospital litter supports are provided for the transport of 24 patients.
- (4) TROOP CARRIER EQUIPMENT.—Airplanes AF44-77444 and subsequent, are provided with conventional equipment for airplanes assigned to troop carrying operations.

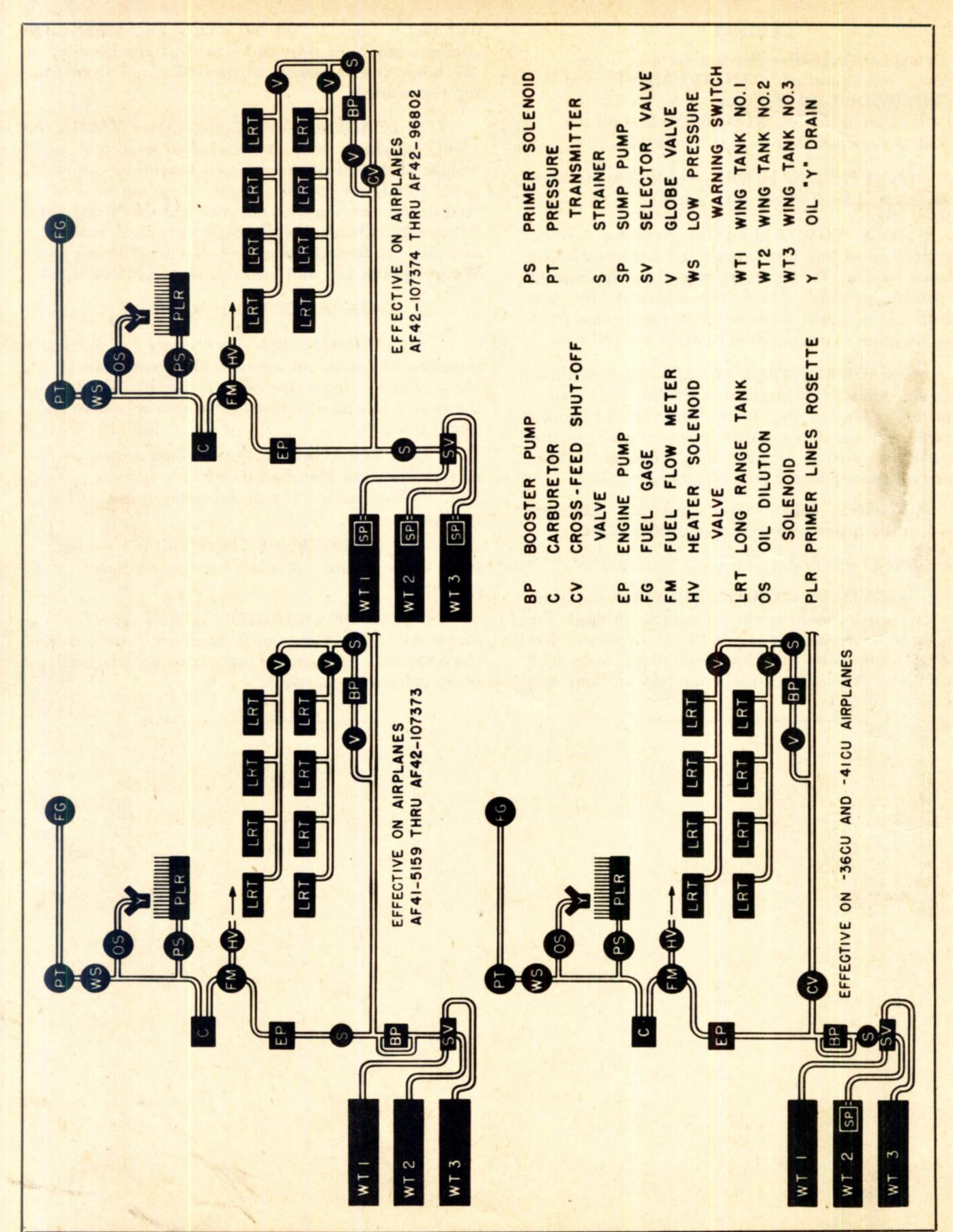
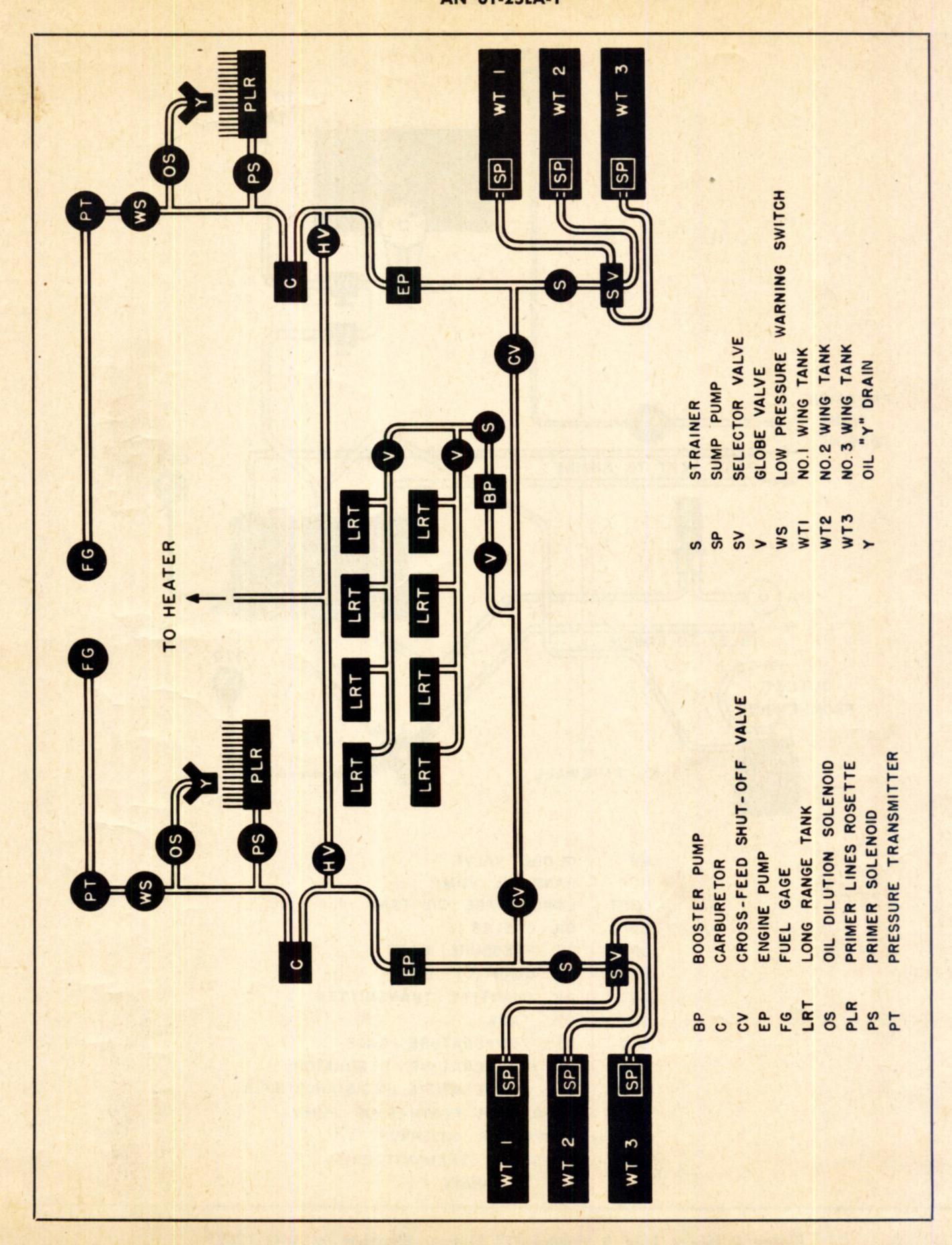


Figure 8 (Sheet 1 of 2 Sheets)-Fuel System



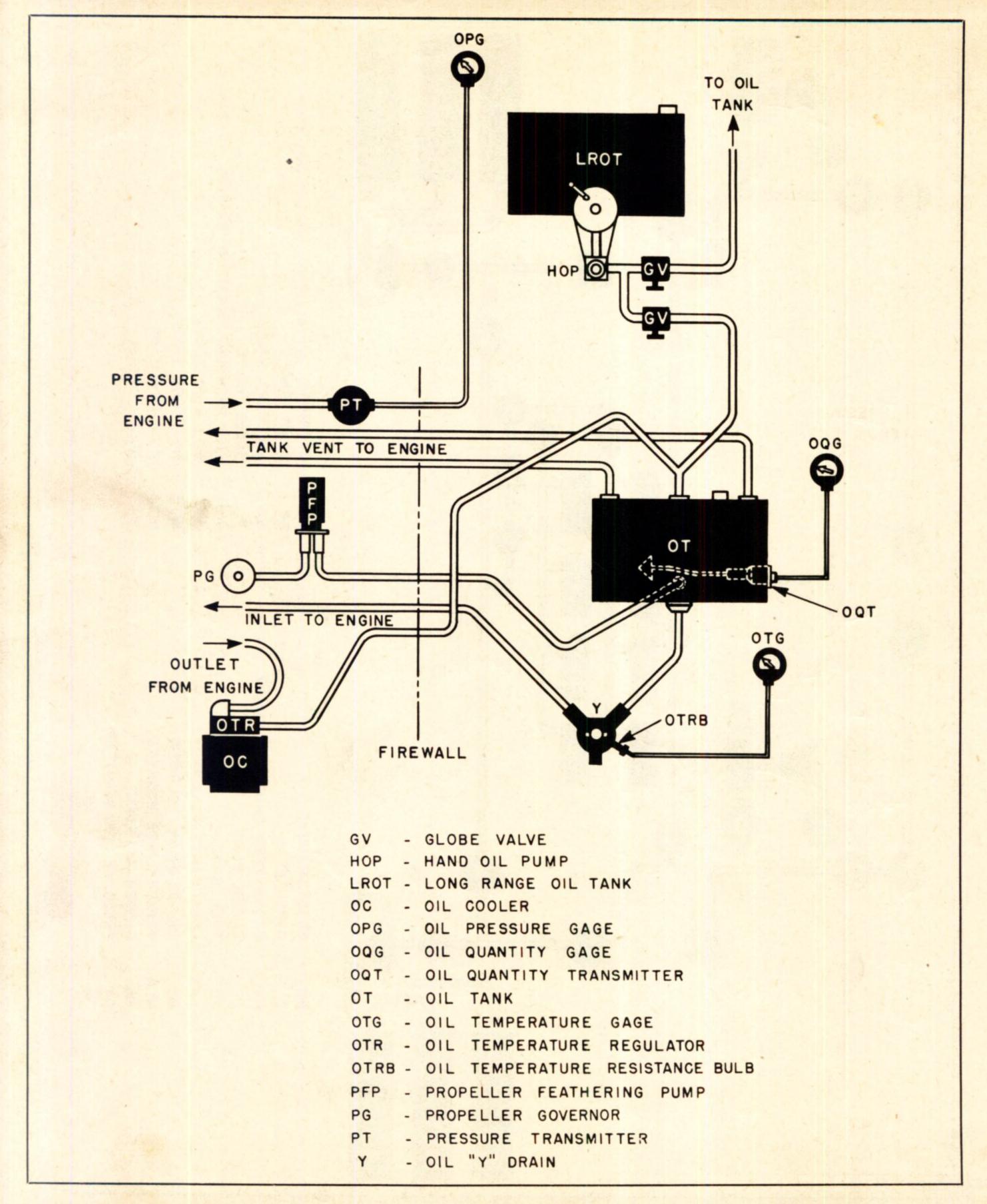


Figure 9 (Sheet 1 of 2 Sheets)-Oil System, Effective To AF41-12333

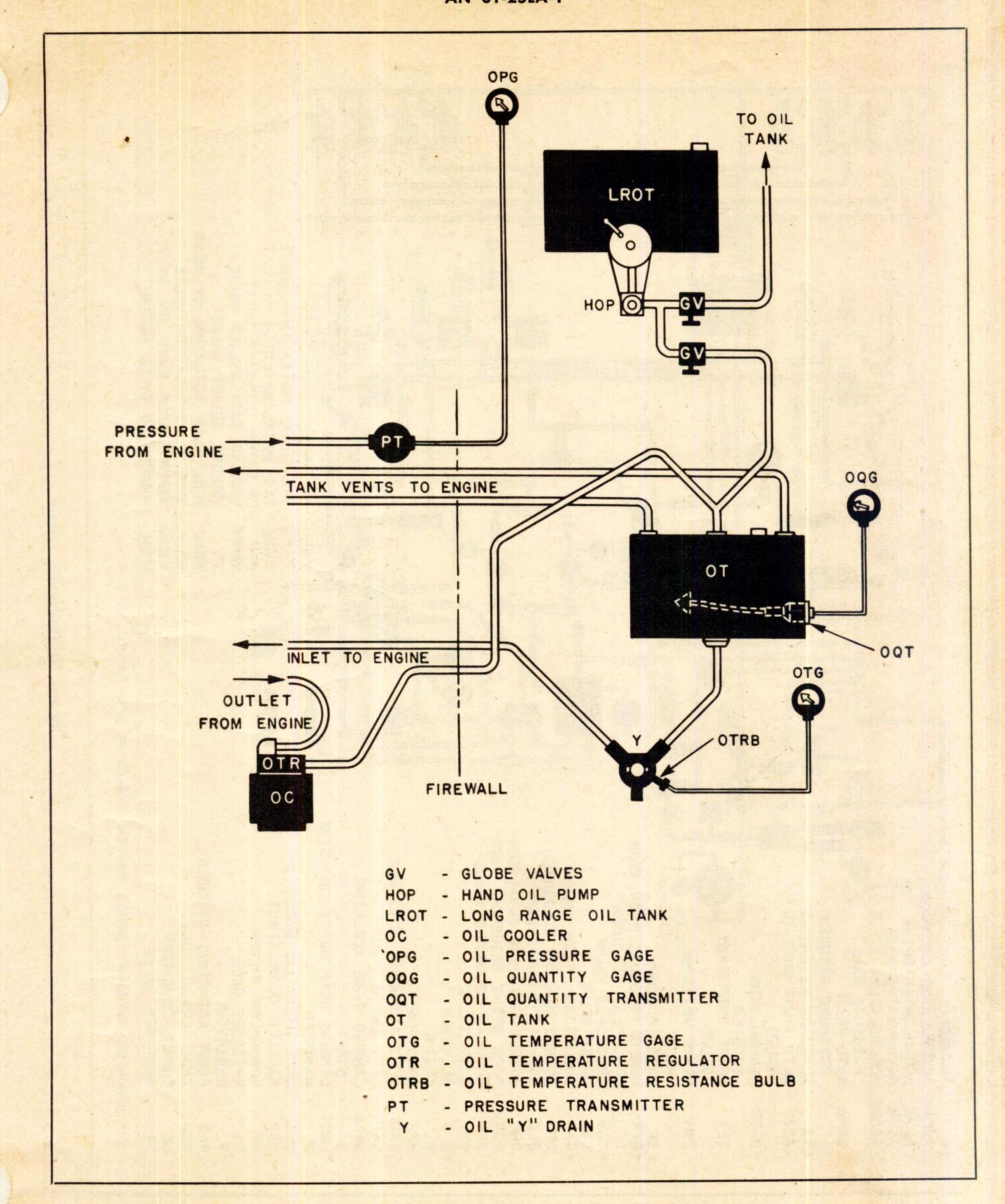


Figure 9 (Sheet 2 of 2 Sheets)—Oil System, Effective From AF41-12334

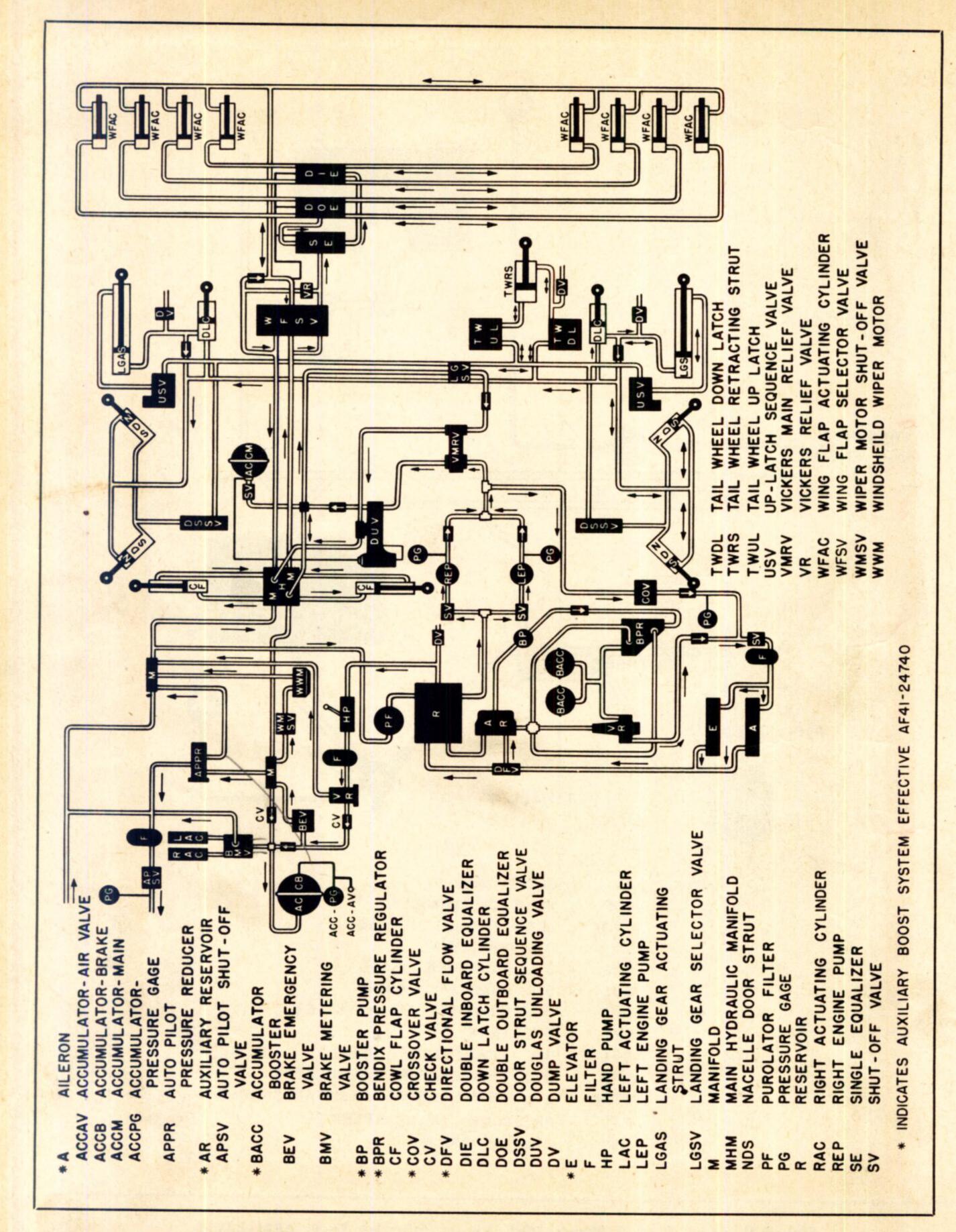


Figure 10-Hydraulic System



1. BEFORE ENTERING THE PILOT'S COMPARTMENT.

a. FLIGHT RESTRICTIONS.

- (1) MANEUVERS PROHIBITED.—No aerobatics are allowed.
- (2) AIRSPEED LIMITATIONS.
 - (a) Maximum gliding speed is 300 mph IAS (at 24 ft. per sec. gust).
 - (b) In level flight 240 mph IAS (at 30 ft. per sec. gust) is allowed.
 - (c) Do not lower landing gear above 150 mph IAS.
 - (d) Do not lower flaps above 135 mph IAS.
 - (e) Do not open cowl flaps above 165 mph IAS.
 - (f) Do not lower landing lights above 150 mph IAS.
 - (g) Do not engage auto-pilot below 140 mph IAS.
 - (b) Do not fly below 100 mph IAS in normal flight conditions.

Note

These limitations may be supplemented or superceded by instructions included in service publications.

b. ENGINE LIMITATIONS.

- (1) 52 in. Hg at 2700 RPM, "AUTO RICH", "LOW" blower for 5 minutes.
- (2) 47 in. Hg at 2700 RPM, "AUTO RICH", "HIGH" blower for 15 minutes.
 - (3) Do not allow cylinder head temperature to exceed 260°C at any time.

Note

If the engine limitations are exceeded, the pilot will immediately upon landing make a report to Squadron, Station, or Sub-Depot Engineering Officer, as the case may be, stating the maximum overpower operating conditions attained, the duration of such overpower operation, the reason, and the total engine time since last overhaul.

(4) The engines will be operated within the following limits of the following table when fuel, Specification No. AN-F-26, Grade 91, is used:

OPERATING LIMITS USING GRADE 91 FUEL

	RPM	Manifold Pressure	Blower	Altitude	Mixture Setting
Maximum Condition of Operation	2700 max.	42 in.	Low	Sea Level to 3500 ft	Auto-Rich
Normal Rated Power	2400	39 in.	Low	Sea Level 10,000 ft	Auto-Rich
	2400 2400	37 in. 32 in.	Low High	Above 10,000	Auto-Rich Auto-Rich
Maximum Cruising	2100	37 in.	Low	Sea Level 8500	Auto-Rich
	2100	34 in.	Low		Auto-Rich
	2100	34 in.	High	Above 8500	Auto-Rich
Desired Cruising	2100 2100 2100 2100	34 in. 31 in. 31 in. 29.5 in.	Low Low High High	Sea Level 10,500 ft Above 10,500	Auto-Lean Auto-Rich Auto-Lean
Minimum Specific	1800	32 in.	Low	Sea Level	Auto-Lean
Consumption	1800	28 in.	Low	10,500 ft	Auto-Lean
	1950	27 in.	High	Above 10,500	Auto-Lean
	1750	27 in.	High		Auto-Lean

c. PRE-FLIGHT CHECK.

- (1) Obtain flight clearance, Form 23, in accordance with AAF Regulation 15-23 (or proper Naval form in accordance with corresponding Naval regulation).
- (2) Check Forms 1 and 1A (or corresponding Navy forms) and make any required entries and sign exceptional release if necessary.
- (3) Check cargo and manifest against Form F in Handbook of Weight and Balance Data, AN 01-1B-40, and sign if weight and balance is within allowable limits and loading is in order.
 - (4) Make outside visual inspection of airplane.
- (5) Entrance to this airplane is through the small personnel door in the main cargo door.
 - (6) Check in main cabin for:
 - (a) Security of cargo.
 - (b) Life rafts in place.
 - (c) Fire extinguishers in place.
 - (d) Emergency doors readily accessible.
 - (e) Hydraulic and anti-icer reservoirs full.

These tanks are located in the left forward main cargo compartment.

- (f) Hydraulic pump suction valves "ON". The valves are located just below the hydraulic reservoir.
- (g) Pilot compartment heater and defroster control "UP".

2. ON ENTERING THE PILOTS' COMPARTMENT.

CHECK FOR ALL FLIGHTS.

- a. Emergency landing gear hand crank (12, figure 13) in place.
- . b. Emergency up-latch release control (2, figure 13) is down.
- c. Hydraulic hand pump handle (14, figure 13) in place.
 - d. Fire extinguishers in place.
 - e. First aid kit available.
 - f. Oxygen walk-around bottles in place.
 - g. Pyrotechnics in place.

3. FUEL AND OIL SYSTEM MANAGEMENT.

Refer to section I, paragraphs 4 and 5.

SEQUENCE OF OPERATING FUEL TANKS

100 Octane Fuel in Six Tanks

No Sump Pumps Installed	Sump Pump In Center Tank Only	Sump Pumps In Six Tanks	
Start engine, warm up, taxi, take off and run at least 30 minutes on "FRONT" tank.	Start engine, warm up, taxi, take off and run at least 30 minutes on "FRONT" tank.	Start engine, warm up, taxi, take off and run at least 30 minutes on "FRONT" tank.	
Subsequent operation-pilot's judgment.	Subsequent operation-pilot's judgment.	Subsequent operation-pilot's judgment.	
Land on fullest tank.	Land on fullest tank.	Land on fullest tank.	

100 Octane Fuel in Rear Tank Only

No-Sump	Sump Pump In	Sump Pumps In
Pumps Installed	Center Tank Only	Six Tanks
Start engine,	Start engine,	Start engine,
warm up,	warm up,	warm up,
taxi on	taxi on	taxi on
"FRONT" tank.	"FRONT" tank.	"FRONT" tank
Take off on	Take off on	Take off on
"REAR" tank.	"REAR" tank.	"REAR" tank.
Switch to	Switch to	Switch to
"FRONT" for	"FRONT" and	"FRONT" for
at least	use to	at least
30 minutes.	completion.	30 minutes.
Reserve	Reserve	Reserve
"REAR" tank	"REAR" tank	"REAR" tank
for landing	for landing	for landing
and emergency.	and emergency.	and emergency.
	Reserve	Other than
	"CENTER" tank	above
	for emergencies	subject to
	as much as	pilot's
	possible.	judgment.

Notes

- 1. Procedure in switching tanks.
 - a. Change tanks before dry (if practical).
 - b. Do not change throttle setting.
 - c. Fuel booster pumps "ON".
 - d. Fuel selector as desired.
 - e. Airplane held level if in flight.
- 2. Procedure in using long range fuel system.
 - a. Electric long range fuel boost pump "ON."

- b. Use top row of tanks as soon as there is bleed back space in front wing tank. Be sure that sufficient altitude has been obtained.
- c. Use lower tanks (when top row is empty) before using wing tanks.

4. STARTING ENGINES.

Note

Use battery cart if available

a. CONTROL PEDESTAL.

- (1) Carburetor filter (16, figure 3) down.
- (2) Emergency brake control (14, figure 3) down.
- (3) Emergency booster control (13, figure 3) down.
 - (4) Flap control (22, figure 3) "UP".
 - (5) Parking brakes (18, figure 3) "ON".
 - (6) Superchargers (19, figure 3) "LOW".
 - (7) Carburetor heat (11, figure 3) "COLD".
- (8) Landing gear (12, figure 3) "DOWN" and locked.
 - (9) Tail wheel (9, figure 3) "LOCKED".
 - (10) Prop selector (8, figure 3) "AUTO".
- (11) Prop circuit breaker switch (23, figure 3), push in.
- (12) Feathering switch (24, figure 3) "NOR-MAL".
- (13) Fuel pump switch (25, figure 3) "HIGH" or "ON".

Note

On airplanes through AF42-107370 having auxiliary booster pumps circuit breaker "OFF".

- (14) Aileron tab control (7, figure 3) neutral (cycle check).
- (15) Oil cooler flap control (4, figure 3) adjust as needed.
- (16) Rudder tab control (6, figure 3) neutral (cycle check).
- (17) Landing lights (5, figure 3) "RETRACT", then "OFF".
- (18) Elevator tab control (28, figure 3) neutral (cycle check).
- (19) Mixture control (3, figure 3) "IDLE CUT-OFF".
 - (20) Prop control (29, figure 3) "HIGH RPM".
 - (21) Throttles (1, figure 3) cracked.
 - (22) Cowl flaps (2, figure 3) "OPEN".

- (23) Auxiliary booster shut-off control (26, figure 3) "ON".
- (24) Cross-feed valve control "OFF". This control is located on the right side of the pedestal.

Note

Engine controls should have 3/16 inch $\pm 1/16$ inch cushion in both extreme positions.

b. OVERHEAD PANEL.

- (1) Fuel pump circuit breaker switches "ON".
- (a) Airplanes through AF42-107370. If no sump pumps are installed turn auxiliary booster pumps "ON" and check pressure (15 to 17 psi). Circuit breakers are located on control pedestal. If sump pumps are installed on the center fuel tanks select center tanks, turn "ON" overhead circuit breaker and increase rheostat to "HIGH" position to check pressure (18 to 21 psi at 28 volts).
- (b) Airplanes AF42-107374 through AF42-96802. Turn overhead circuit breaker "ON", increase rheostat to "HIGH" position, and select each tank to check fuel pressure (18 to 21 psi at 28 volts or 16 to 18 psi at 24 volts).
- (c) Airplanes AF42-96803 and subsequent. Turn overhead circuit breaker "ON", and cycle each fuel selector to check pump pressures (18 to 21 psi at 28 volts or 16 to 18 at 24 volts).
 - (2) Check primer for drop in fuel pressure.
 - (3) Check oil dilution for drop in fuel pressure.
 - (4) Fuel pump switches "OFF".

Note

Fuel pressure signal assembly should come on between 13.5 and 14.5 psi.

- (5) Control booster heater circuit breaker switch (53, figure 7) "ON" to check voltmeter deflection, then "OFF".
- (6) Anti-icing circuit breaker switch (8, figure 7) "ON".
- (a) Carburetor anti-icer switch (26, figure 7) "ON" (listen for pump). Then "OFF".
- (b) Pitot anti-icer switch (27, figure 7) "ON". (Listen for pump). Then "OFF".
- (7) Warning bell, check switch (28, figure 7) "ON" and "OFF".
- (8) Prop anti-icer rheostat switch (22, figure 7) "ON" for visual check of prop slinger. Then "OFF".
- (9) Pitot heater switches (4, figure 5), left and right. (Check for voltmeter deflection).

c. INSTRUMENT PANEL.

(1) Set altimeter.

Note

To check the next two items, the inverter must be on "MAIN", then "OFF".

- (2) Check fuel and oil quantity gages on airplanes prior to AF42-96803.
 - (3) Check compass ring light.
- (4) Compare heater temperature with outside air temperature.
 - (5) Oxygen pressure 450 psi.
 - (6) Check oxygen regulator.
 - (7) Directional gyro uncaged.
 - (8) Air speed indicator. (Check for leaks).
- (9) Accumulator valve "DOWN" (open) on airplanes prior to AF42-96803.
 - (10) Rate of climb "ZERO".
- (11) Manifold pressure gages. (Should indicate approximate barometric pressure).
 - (12) Tachometer. (Zero setting both pointers).
 - (13) Instrument vacuum 3.75 to 4.25 in. Hg.
- (14) Oil temperature (compare with outside air temperature).
 - (15) Flap indicator "UP".
- (16) Carburetor air temperature (compare with outside air temperature).
- (17) Brake accumulator system pressure 600 (+50-0) psi.

5. WARM-UP AND GROUND TEST.

Note

Start right engine first.

a. RUN-UP.

- (1) Master ignition switch (14, figure 7) "ON".
- (2) Fuel pumps "ON".
- (3) Prime (19, and 45, figure 7) at pilot's discretion.
 - (4) Receive all-clear signal.
- (5) Energize starter (21, and 43, figure 7) 15-20 seconds.
- (6) Hold engage switch down (one minute maximum) until engine fires.
- (7) Ignition switch (15 and 18, figure 7) on "BOTH" after engine has completed two revolutions.

- (8) Move mixture control to "AUTO RICH" when engine fires. If engine stops firing, return to "IDLE CUT-OFF".
 - (9) IN CASE OF FIRE.
 - · (a) Fuel selector "OFF".
 - (b) Throttle "OPEN".
 - (c) Cowl and oil cooler flaps "OPEN."
 - (d) Pull fire extinguisher control.
 - (e) Mixture "IDLE CUT-OFF".
 - (f) Ignition switch "OFF".

Note

"AUTO RICH" will be used for all ground running. "IDLE CUT-OFF" will be used to stop engines. Mixture control will be in this position when the engine is not running.

- (10) Throttle 900-1000 RPM after definite rise in oil pressure is seen.
 - (11) Check fuel pressure with booster pumps off.
- (12) Open oil coolers when pressure begins to return to normal.

Note

While waiting for engine to warm up, check auto-pilot and de-icer system.

- b. AUTO-PILOT CHECK.—Auto-Pilot pressure 100-150 psi; 3.75 to 4.25 in. Hg.
 - (1) Gyros uncaged.
 - (2) Indices lined up.
 - (3) Speed control 2½-3 or Average. .
 - (4) Auto-pilot "ON".
 - (5) Servo bypass "BLEED".
- (6) Cycle all controls slowly and leave for 30 seconds at each extreme position, then return to neutral.
 - (7) Servo bypass "NORMAL".
 - (8) Cycle all controls.
 - (9) Turn speed controls to 6-7. (Note increase).
 - (10) Check over-power valve.
 - (11) Auto-pilot "OFF".
 - (12) Speed control "0" or "OFF".
 - c. DE-ICER CHECK.
 - (1) Circuit breaker switch (7, figure 7) "ON".
 - (2) Pressure (8-10 psi).
 - (3) Circuit breaker switch "OFF".

Note

Cycle should complete after circuit breaker is "OFF".

d. HYDRAULIC SYSTEM CHECK.

- (1) Check main system pressure by operating flaps and pulling emergency booster control (13, figure 3) up. Engine pump gages (figure 6) show an advance to approximately 1350 psi and a drop to 0 psi, indicating system is fully charged.
- (2) Check auxiliary booster system pressure by operating ailerons or elevator and pushing emergency booster control down. Main hydraulic system pressure gage (figure 6) will show a range of from approximately 800 to 1000 psi, indicating system is fully charged.
 - (3) Operate cowl flaps, (check visually).
 - (4) Operate wing flaps, (check visually).
 - (5) Auxiliary booster "OFF", (cycle controls).
 - (6) Check all operating controls.
- (7) Check range of main system unloading valve; emergency booster control up, operating elevator or ailerons slowly. A range of from approximately 1050 psi to 1350 psi will show on main hydraulic system pressure gage.
- (8) Check range of booster system unloading valve in same manner, emergency booster control up. Reading should show an approximate range of from 800 to 1000 psi.
 - e. ENGINE RUN-UP.
 - (1) Both engines at 1100 RPM.
 - (2) Parking brakes on.
 - (3) Mixture controls "AUTO-RICH".

Note

Run one engine up at a time.

- (4) Throttle to 1500 RPM.
- (5) Move supercharger control to "HIGH" blower. (Check momentary oil pressure drop).
 - (6) Carburetor heat control "ON".
- (7) Throttle to 2000 RPM. (Check carburetor heat rise, then off).
- (8) Move supercharger control to "LOW" blower. (Note 1 to 2 in. Hg drop in manifold pressure).
 - (9) Fuel pressure will be 16 to 18 psi.
 - (10) Oil pressure will be 70 to 85 psi.
 - (11) Oil temperature will be 40 to 100°C.
- (12) Cylinder head temperatures will be 120 to 232°C.

- (13) Main system vacuum will be 3.75 to 4.25 in. Hg.
- (14) Check the manual propeller operation with the selector switch first in "DEC" and then in "INC".
- (15) Check feathering by momentarily decreasing 200 RPM maximum.
- (16) Reduce 200 RPM using propeller governor control. Return control to "HIGH RPM".
 - (17) Horsepower output check.
 - (a) Advance throttle to obtain 2500 RPM.
- (b) Note outside air temperature and manifold pressure.
- (c) Manifold pressure should not exceed following allowables at 2500 RPM:

Outside	M:(-11	0 11
	Manifold	Outside
Air	Pressure	Air
Temperature	in. Hg	Temperature
°C		°F
-35	43.2	-31
-30	42.8	-22
-25	42.5	-13
-20	42.1	-4
-15	41.8	+5
-10	41.4	+14
-5	41.1	+23
0	40.7	+32
+5	40.4	+41
+10	40.0	+50
+15	39.7	+59
+20	39.3	+68
+25	39.0	+77
+30	38.6	+86
+35	38.3	+95
+40	37.9	+104
+45	37.6	+113
+50	37.2	+122
+55	36.9	+131

- (18) Check magnetos at 30 in. Hg (100 RPM maximum drop).
 - (19) Throttle back to 1000 RPM.

6. SCRAMBLE TAKE-OFF.

Take off as soon as the engines will take the throttles. Oil dilution may be used to assist warm-up; however, care should be taken not to over-dilute.

7. TAXIING INSTRUCTIONS.

This is a conventional type airplane. However, due to the large keel surface it has a tendency to weather-cock. To assist in taxiing, the copilot should lock and unlock tail wheel as necessary.

8. TAKE-OFF.

WARNING

Tabs MUST be in neutral setting. If tabs are not in neutral setting, excessive control loads may develop. Misuse of trim tabs may render the airplane uncontrollable as this aircraft is sensitive to trim.

- a. Prior to Take-off.
 - (1) Perform customary take-off checks.
 - (2) Flaps full "UP" for normal take-off.
- (3) Steer with throttles until rudder control is effective. It is good practice in this airplane to aid the take-off with elevator trim. Trim carefully.
 - b. At Take-off.
- (1) Take-off at 52 in. Hg 2700 RPM. Obtain 120 mph.
- (2) Stop wheels. Retract landing gear, then move control handle to "NEUTRAL".
- (3) Do not exceed 120 mph with full power on until 300 ft. is reached.
- (4) At 300 feet reduce to 41.5 in. Hg. and 2400 RPM. Hold to 1000 feet at 130 MPH.
 - (5) At 1000 feet reduce to desired climb power.
 - c. Short field take-off.
 - (1) Use 1/4 flap regardless of load.
- (2) Hold airplane with brakes until take-off power is applied, then release brakes and start take-off run. Break from the ground as soon as flying speed is attained.
 - (3) Landing gear "UP" as quickly as possible.
- d. CROSSWIND TAKE-OFFS.—Because of large vertical fin and fuselage areas, this airplane has a tendency to weathercock.
- (1) Keep tail on the ground as the locked tail wheel materially aids in keeping the airplane straight.
- (2) Lead with upwind throttle sufficiently to correct for weathercocking tendencies.
- (3) Hold the airplane on the ground until a clean break can be made. Bouncing back on a crosswind take-off is apt to damage the landing gear because of excessive side thrust.

9. ENGINE FAILURE DURING TAKE-OFF.

WARNING

Desirable single engine flying speed is 120 mph.

a. ON THE GROUND.—Cut the other engine and apply brakes. Ground loop if necessary to avoid hitting obstacle head-on.

- b. IF AIRBORNE AND BELOW THE SAFE SIN-GLE ENGINE FLYING SPEED.—If sufficient runway remains, land straight ahead. If there is insufficient runway or major obstructions, retract landing gear, maintain full power on good engine and fly straight ahead. This airplane will maintain single engine flight at 110 MPH at normal gross weight.
- c. AFTER DESIRED SINGLE ENGINE FLYING SPEED IS REACHED.—Apply opposite rudder. Feather dead engine. Relieve rudder pressure by trim tab; shut down dead engine, carefully gain altitude and flying speed until a landing can be made. Refer to Take-off, Climb and Landing Chart, figure 27, appendix I.

10. CLIMB.

- a. Do not exceed 120 mph with full power on until 300 ft. in normal twin engine operation.
- b. At 300 ft., reduce to 41.5 in. Hg, 2400 RPM and hold to 1000 ft. at 130 mph.
 - c. At 1000 ft. reduce to desired climb power.
 - d. Oil cooler flaps "OPEN".
- e. Cowl flaps closed to "1/2" minimum, however do not exceed cylinder head temperature of 260°C.
- f. When above desired cruise level, trim airplane and let down slowly to increase flying speed.
- g. Reduce power to desired cruise setting. See Take-off, Climb, and Landing Chart, figure 27.
- b. Mixture control "AUTO-RICH" 5 minutes after establishing cruise power.
- i. Use fuel booster pumps to maintain fuel pressure of 16-18 psi as required.

11. GENERAL FLYING CHARACTERISTICS.

a. AIRPLANE OPERATION.

(1) This airplane is very stable in all respects. Handling characteristics are good although the airplane is slightly heavy on controls and sensitive to trim tabs. It is necessary to trim for climb and it is helpful to trim in other changes of altitude.

Optimum cruise is at 147 mph IAS or 150 mph corrected IAS.

(2) Operation on auto-pilot is conventional. Before engaging the auto-pilot, it should first be determined by manual control that auto-pilot control is safe under existing conditions. Never engage the auto-pilot at less than 140 mph IAS. Do not operate the autopilot in extremely turbulent air or when normal rated power is not being delivered by one engine.

b. . ENGINE OPERATION.

(1) Operate engines within limitations given in Power Plant Chart, figure 12, section III. See Flight Operation Instruction Charts, figure 28, appendix I.

- (2) Increase RPM before increasing manifold pressure.
- (3) Decrease manifold pressure before decreasing RPM.
 - (4) Shift blowers quickly.

Note

Every two hours of flight, shift from "LOW" blower to "HIGH" blower and leave in "HIGH" blower for 10 minutes.

12. STALLS.

Stalling characteristics in this airplane are excellent under all conditions. A mild buffeting occurs in power-off stalls about 5 to 7 mph before the stall occurs. Aileron control is good throughout the stall and ailerons remain partially effective through the stall and recovery.

In power-on stalls, buffeting is severe and the stall is more violent, with the airplane having a tendency to drop on either wing.

STALLING SPEEDS

	40,000 lb	45,000 lb	50,000 lb
Flaps up, gear up,			
power off	88 mph	100 mph	110 mph
Flaps up, gear up,			
power on	80 mph	92 mph	97 mph
Flaps down 35°, gear			
down, power on	67 mph	79 mph	87 mph
Flaps down 35°, gear			
down, power off	77 mph	84 mph	89 mph

SPINS.

This airplane should not be spun as loads imposed will probably result in structural failure. Because of stability and aileron effectiveness in stall, there should be no accidental spins. If a spin does occur, use conventional recovery.

14. PERMISSIBLE ACROBATICS.

No acrobatics permissible with this airplane.

15. DIVING.

No dives are to be attempted in this airplane. NEVER exceed 300 mph.

16. NIGHT FLYING.

Refer to section I, paragraph 11. d. for location of light switches and operation of lights. The landing lights are so directed that the beam follows the landing path, which is contrary to the usual installation. Do not allow landing lights to burn on the ground unless absolutely necessary as filaments and lenses will burn out.

25

17. APPROACH AND LANDING.

CAUTION

Do not lower landing flaps above 135 mph; landing gear above 150 mph. Do not open cowl flaps above 165 mph.

a. DOWNWIND LEG CHECK.

- (1) Landing gear down and locked.
- (2) Flaps—at 35 degrees for normal landing, fixed stop is set at this position.
- (3) Recommended approach speed 120 mph; minimum approach speed 100 mph.
- (4) Cowl flaps closed for normal approach, open when excess power is used.
 - (5) Battery and generator switches "ON".
 - (6) Mixture control—"AUTO-RICH".
 - (7) Low blower.
- (8) Propeller—2400 RPM; at 2400 RPM, takeoff can be made at 41.5 in. Hg. If more power is needed 2700 RPM at 52 in. Hg may be used.
 - (9) Tail wheel locked.
- (10) Fuel booster pumps "LOW" on airplanes equipped with "HIGH"-"LOW" switch.
- b. CROSS-WIND LANDING.—Use combination crab and wing low method. Kick off crab before landing so as to avoid damage to landing gear from side forces imposed. Use flaps with caution in strong cross winds.
- c. EMERGENCY TAKE-OFF IF LANDING IS NOT COMPLETED.—Retract landing gear as soon as possible. Do not exceed 41.5 in. Hg at 2400 RPM. If additional power is necessary, increase RPM to 2700 and use full throttle.
- d. BRAKES.—Avoid heavy use of brakes and if excessive brake pressures have been applied, do not lock parking brake immediately when parking. Damage may be caused to the brakes if heat is not allowed to dissipate.

18. STOPPING OF ENGINES.

- a. NORMAL.
 - (1) Propeller controls full forward.
 - (2) RPM 1100.
 - (3) Cowl flaps "OPEN".

- (4) Oil cooler "OPEN".
- (5) Generator switches "OFF".
- (6) RPM 1400.
- (7) Supercharger controls "HIGH" blower for 15 seconds.
- (8) Supercharger controls "LOW" blower for 15 seconds.
 - (9) Mixture control "IDLE CUT-OFF".
 - (10) Fuel "OFF".
- (11) When engine starts to stop, push throttle wide open.
 - (12) All switches and circuit breakers "OFF".
- b. OIL DILUTION.—Refer to section VI, paragraph 1. f. (1) (e).

19. BEFORE LEAVING PILOTS' COMPARTMENT.

- a. All switches and circuit breakers "OFF".
- b. Fuel "OFF".
- c. Auto-pilot "OFF".
- d. Cowl flaps and oil cooler "CLOSED".
- e. Throttles closed.
- f. Supercharger "LOW" blower.
- g. Landing gear "DOWN" and "LOCKED".
- b. Radio "OFF".
- i. Tail wheel "LOCKED".
- j. Trim controls neutral.
- k. Heater "OFF".
- l. Parking brakes "ON".

20. MOORING.

- a. Under normal wind conditions, moor with airplane nose into wind.
- b. When high winds are expected, moor tail into wind.

Note

Do not use auto-pilot as a control lock.

c. In either case, utilize control locks.

Section III



OPERATING DATA

AIRSPEED INSTALLATION CORRECTION TABLE

I.A.S.

CORRECTION

FLAPS RETRACTED

100 MPH	Add 2 MPH
150 MPH	Add 2 MPH
200 MPH	Add 2 MPH
250 MPH	Add 2 MPH

LANDING GEAR & FLAPS EXTENDED

80 MPH	Add 1 MPH
90 MPH	Add 1 MPH
100 MPH	Add 1 MPH
110 MPH	Add 1 MPH
120 MPH	Add 1 MPH
130 MPH	Add 1 MPH

POWER PLANT CHART

C-46 SERIES

PROPELLER(S)

CURTISS ELECTRIC

4 BLADE-814 DESIGN-13.5 FT. DIA.

R-2800-51 (2SBG) -75 (2SBG)

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.	COOLANT TEMP.
DESTRED	16-18	70-80	60-75	AIR
MAXIMUM	19	100		COOLED
MINIMUM	14	50		
IDLING	7	25		

MAXIMUM PERMISSABLE DIVING RPM: 2800 MINIMUM RECOMMENDED CRUISE RPM: 1600 MAXIMUM RECOMMENDED TURBO RPM:

OIL GRADE: (S) 1120 (W) 1100 A FUEL GRADE: 100/130 AN-F-28

	R EMERGE			MBAT EME	RGENCY)	K	OPERATING CONDITION	>		RMAL RA	NUOUS)		IMUM CR	
		HINDIES		260°C	MINUTES	м	TIME LIMIT AX. CYL. HD. TEI	1P.		260°C			232°C	-
	1			AR 2700		No.	R. P. M.			AR 2400			AL 2100	
MANIF. PRESS.	SUPER- CHARGER	FUEL (1) Gal/Min	MANIF. PRESS.	SUPER- CHARGER	FUEL (1) Gal/Min	STD. TEMP.	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER- CHARGER	FUEL GPH (2)	MANIF. PRESS.	SUPER- CHARGER	FUEL GPH (2)
						-55.0 -55.0 -55.0	40,000 FT. 38,000 FT. 36,000 FT.	-67.0 -67.0 -67.0						
					H	-52.4 -48.4 -44.4	34,000 FT. 32,000 FT. 30,000 FT.	-62.3 -55.1 -48.0						
		423	F. T. F. T. F. T.	HIGH HIGH HIGH	2.0 2.5 2.5	-40.5 -36.5 -32.5	28,000 FT. 26,000 FT. 24,000 FT.	-40.9 -33.7 -26.5	F. T. F. T. F. T.	HIGH HIGH HIGH	85 100 115	F. T. F. T. F. T.	HIGH HIGH HIGH	65 70 75
			F. T. F. T. F. T.	HIGH HIGH HIGH	3.0 3.5 3.5	-28.6 -24.6 -20.7		-19.4 -12.3 - 5.2	F. T. F. T. F. T.	HIGH HIGH HIGH	130 150 170	F. T. 32 32	HIGH HIGH HIGH	80 85 85
			F. T. F. T. 47	HIGH HIGH HIGH	4.0 4.5 4.5	-16.7 -12.7 - 8.8	16,000 FT. 14,000 FT. 12,000 FT.	2.0 9.1 16.2	F. T. 42 42	HIGH HIGH HIGH	195 210 210	32 F. T. F. T.	HIGH LOW LOW	80 80 90
			F. T. F. T. F. T.	LOW LOW	4.0 4.0 4.5	- 4.8 - 0.8 3.1	10,000 FT. 8,000 FT. 6,000 FT.	23.4 30.5 37.6	F. T. F. T. 42	LOW LOW LOW	175 190 190	32 32 32	LOW LOW LOW	100 95 90
			F. T. 51 51	LOW LOW LOW	4.5 5.0 5.0	7.1 11.0 15.0	4.000 FT. 2,000 FT. SEA LEVEL	44.7 51.8 59.0	42 42 42	LOW LOW LOW	185 180 175	32 32 32	LOW LOW LOW	85 80 80

GENERAL NOTES

(1) Gal/Min: APPROXIMATE U.S. GALLON PER MINUTE PER ENGINE 2) GPH: APPROXIMATE U.S. GALLON PER HOUR PER ENGINE.

F.T.: MEANS FULL THROTTLE OPERATION. VALUES ARE FOR LEVEL FLIGHT WITH RAM.

FOR COMPLETE CRUISING DATA SEE APPENDIX I
NOTE: TO DETERMINE CONSUMPTION IN BRITISH
IMPERIAL UNITS, MULTIPLY BY 10 THEN DIVIDE
BY 12. RED FIGURES ARE PRELIMINARY SUBJECT
TO REVISION AFTER FLIGHT CHECK.

TAKE-OFF CONDITIONS:

2700 R.P.M. - 52 IN. HG. - AUTO RICH MIXTURE

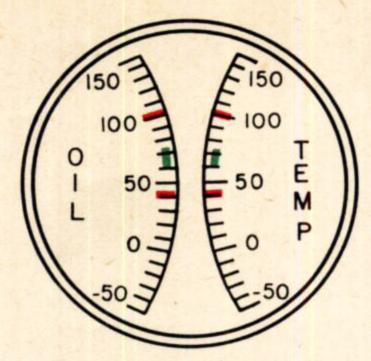
CONDITIONS TO AVOID: GENERATOR LIMITATION RESTRICTS OPERATIONS BELOW 1600 RPM IN FLIGHT.

SPECIAL NOTES

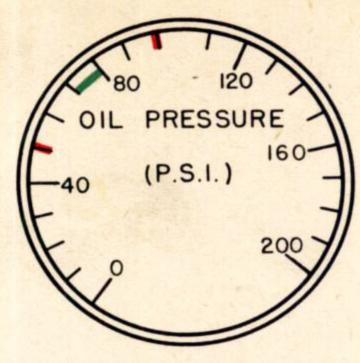
DATA AS OF 3/8/45 BASED ON FLIGHT TEST

AAFMC-526 4-1-44

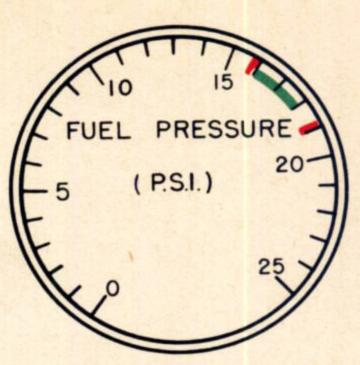
Figure 11-Power Plant Chart



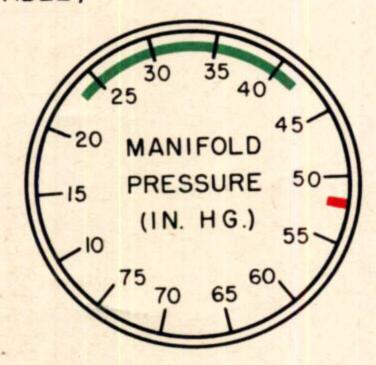
RED LINE AT 40°C (MINI -MUM) GREEN ARC 60° TO 75°C (OPERATING RANGE DESIRABLE) RED LINE AT 100°C (MAXIMUM A LLOW-ABLE)



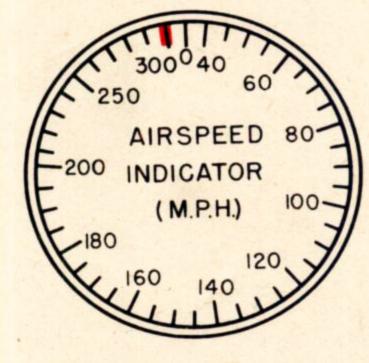
RED LINE AT 50PSI (MINI-MUM) GREEN ARC 70 TO 80 PSI (DESIRABLE OPERATING RANGE) RED LINE AT 100 PSI (MAXIMUM) PSI

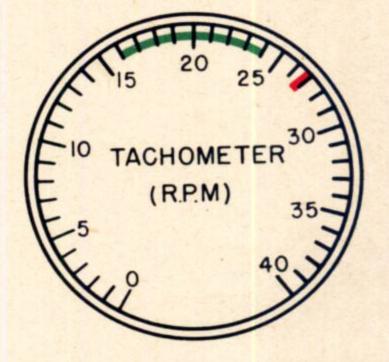


RED LINE AT 16PSI (MINI -MUM) FOR FLIGHT-NOT IDLE) GREEN ARC 16 PSI TO 18PSI (DESIRABLE OPERATING RANGE) RED LINE AT 19 PSI (MAXIMUM)

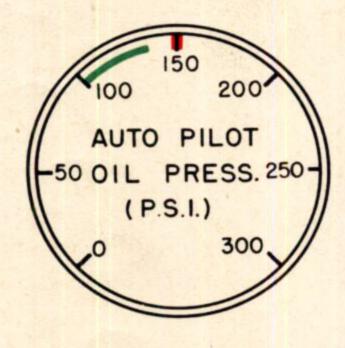


ERATING RANGE) RED LINE (MAXIMUM) AT 52" (MAXIMUM)

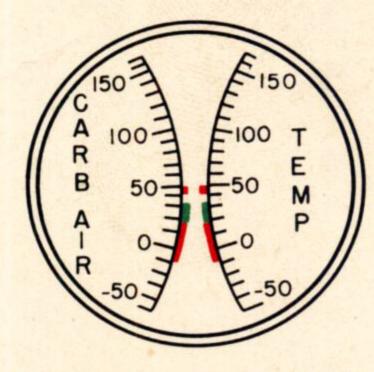




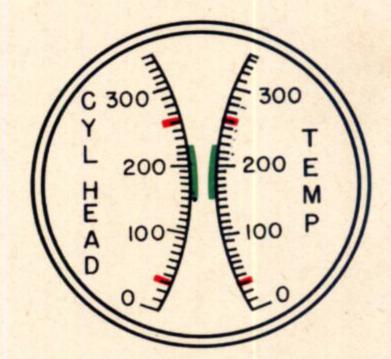
GREEN ARC 23"TO 42" (OP- RED LINE AT 300 MPH GREEN ARC 1600 TO 2400 RPM (OPERATING RANGE) RED LINE AT 2700 R P M (MAXIMUM)



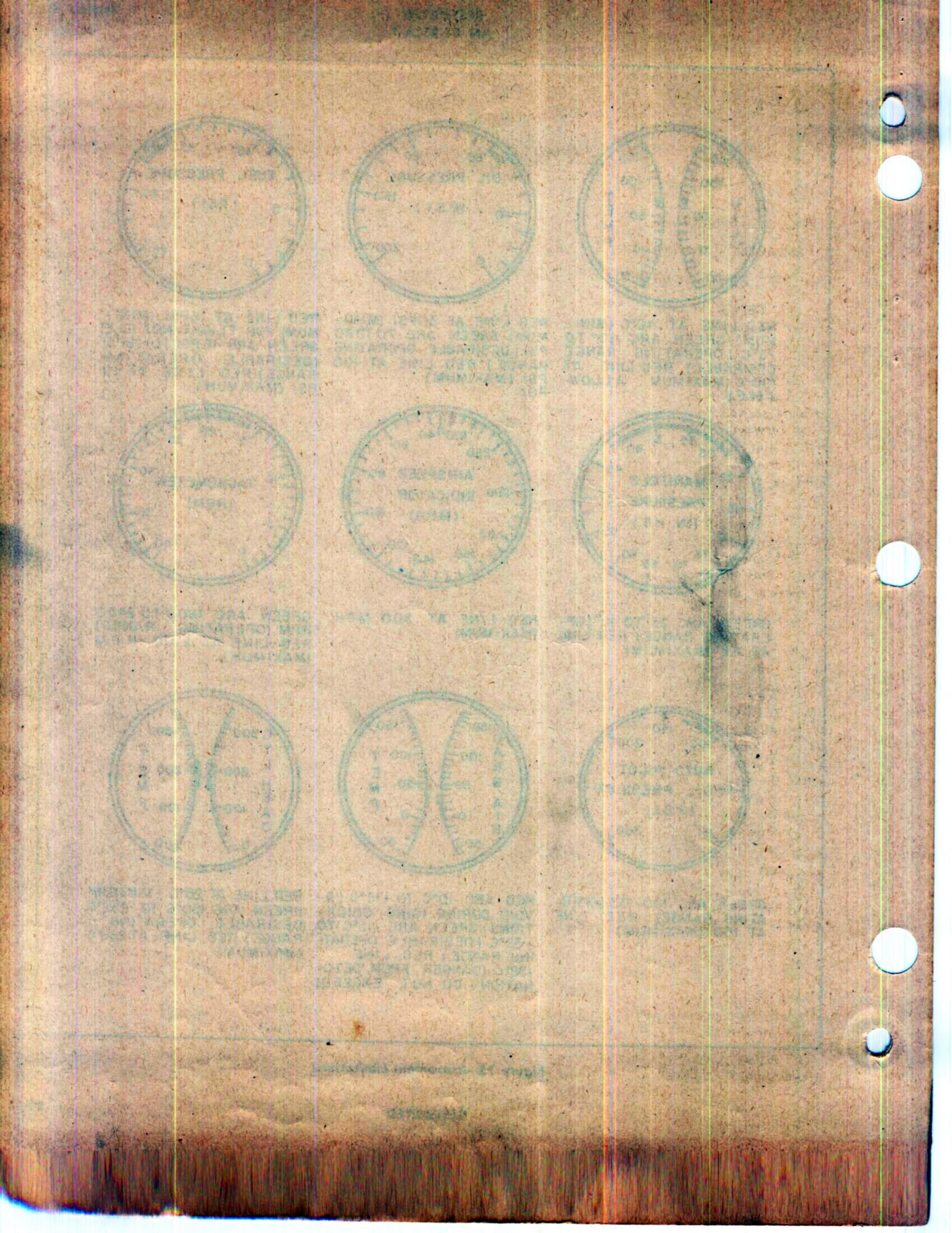
GREEN ARC 100-135 (OPER-ATING RANGE) RED LINE AT 150 (MAXIMUM)



VOID DURING ICING CONDI-TIONS) GREEN ARC +15°C TO +32°C (DESIRABLE OPERAT-ING RANGE) RED LINE +38°C (DANGER FROM DETO-NATION - DO NOT · EXCEED)



RED ARC -10°C TO +15°C (A- RED LINE AT 25°C (MINIMUM) GREEN ARC 150°C TO 232°C (DESIRABLE OPERATING RANGE) RED LINE AT 260°C (MAXIMUM)





1. EMERGENCY EQUIPMENT AND PROVISIONS.

a. FIRE EXTINGUISHERS.

- (1) GENERAL.—An engine fire extinguisher system, comprising eight syphon type carbon dioxide cylinders, is installed in each nacelle. Each system is individually controlled from the pilots' compartment. In addition, three hand-operated fire extinguishers are provided for general use. One, of carbon dioxide type, is stowed in the pilots' compartment on the lower forward leg of the liaison radio rack. The second, of similar type, is stowed in the main cabin near the hydraulic reservoir. The third, of carbon tetrachloride type, is stowed just aft of the main cabin door.
- (2) CONTROLS.—A T-type release handle for each engine fire extinguishing system is installed on the instrument panel. To operate, pull the handle. Instructions for operating the hand-type fire extinguishers are shown on their name-plates.
- (3) ENGINE FIRE WARNING LIGHTS.— Two red warning lights for indicating fire in the respective engine compartments, are located on the center portion of the instrument panel on airplanes AF41-24740 and up.
- b. PARACHUTE RACKS.—Four parachute racks are installed on the left side of the main cabin directly aft the pilots' compartment door. Three of the racks are on the underside of the seats and one is directly above the seats, on airplanes previous to AF44-77444. On airplanes AF44-77444 and subsequent, the racks are on the upper left side of the cabin aft of the pilots' compartment.
- c. LIFE RAFTS.—Stowage for eleven life rafts is provided. Ten are stowed on the aft fuselage bulkhead and one at the right of the radio rack in the main cabin on airplanes prior to AF44-77444. On airplanes AF44-77444 and subsequent, the single raft is stowed at station 163 on the right side of the main cabin.

Note

When litter supports are installed, life rafts will be stowed in the lower forward cargo compartment.

d. FIRST-AID KIT.—A first-aid kit (1, figure 13) is stowed on the back of the pilot's seat.

e. SIGNAL PISTOL.—A signal pistol and cartridges (10, figure 13) are stowed above the data case to the left of the pilot. The pistol is first loaded and then inserted in an adapter located in the ceiling of the pilots' compartment.

2. MECHANICAL FAILURES.

a. ENGINE FAILURE DURING FLIGHT.

- (1) INCREASE POWER TO 2400 RPM AND 41 IN. HG "AUTO RICH", "LOW" blower. If necessary, power may be increased to 2550 RPM and 49 in. Hg, "AUTO RICH", "LOW" blower or 2550 RPM and 44 in. Hg "AUTO RICH"-"HIGH" blower. Maximum cylinder head temperature 260°C.
 - (2) Feather dead engine.
 - (3). Trim airplane.
- (4) Close down dead engine. Turn off all switches on dead engine.
- (5) Make complete cockpit check. If trouble can be corrected in flight, correct and restart engine. If not, consult Flight Operation Instruction Charts, figure 28, appendix I, for maximum range operation, and land at first opportunity.

Note

If the left engine fails, pull booster emergency valve control at base of control pedestal.

b. RUNAWAY PROPELLER.

Note

Check selector switch (8, figure 3) for "AUTO" position.

- (1) If propeller runs away while still on the ground, cut power on live engine and stop airplane.
- (2) If propeller runs away after airplane is airborne, land straight ahead if enough runway remains; otherwise hold RPM to 3000 with throttles until safe single engine speed is reached.
- (3) If Curtiss Electric propeller runs away after safe single engine flying speed is reached:
- (a) Propeller selector switches are in "AUTO".

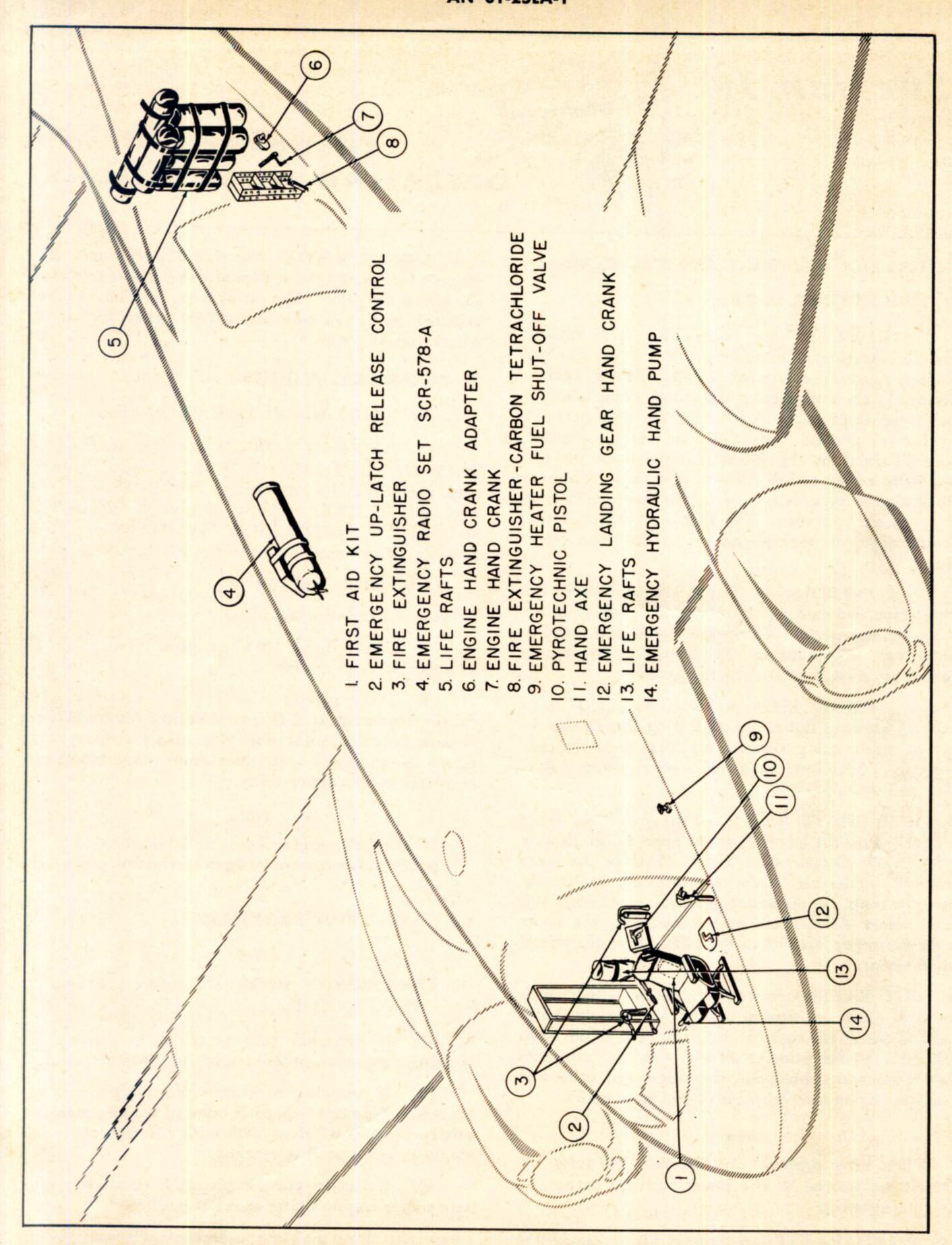


Figure 13-Emergency Equipment

- (b) If circuit breaker (23, figure 3) is not pushed in, then put selector switch to "DEC RPM" position or operate feathering switch (24, figure 3) momentarily. If RPM does not reduce, it is evident that there is a complete electrical failure and propeller controls will have no effect on the pitch.
- (c) In case of complete propeller electrical failure, reduce RPM with throttle; allow a maximum of 3000 RPM and a minimum of 15 in. Hg manifold pressure. If RPM cannot be kept within these limits, feather propeller, shut down faulty engine, and land at first opportunity.
- (4) If Hamilton Standard propeller runs away after safe single engine flying speed is reached:
- (a) Push in feathering button until desired RPM is reached, then pull out feathering button manually.
- (b) If governor does not hold, feather again when RPM exceeds 2700 RPM. Continue as long as necessary.

c. OIL SYSTEM FAILURE.

Use single engine procedure.

d. FUEL SYSTEM FAILURE.

- (1) In the event of engine-driven pump failure, turn on fuel booster pumps (25, figure 3) on side of pump failure, to maximum fuel pressure.
- (2) In the event of a broken fuel line, turn booster pumps and fuel tank selector valve control (8, figure 4) or (11, figure 5) "OFF" and use single engine procedure.
- e. HEATER SYSTEM FAILURE.—If cockpit heater fails, push down emergency valve (8, figure 25) to obtain hot air from the cabin heater for the pilots' compartment.

f. DE-ICER SYSTEM FAILURE.

Shut down the system; as no emergency procedure is provided.

g. AUTO-PILOT SYSTEM FAILURE.

Shut auto-pilot "OFF"; as no emergency procedure is provided.

b. HYDRAULIC SYSTEM FAILURE.

- (1) AUXILIARY BOOSTER, SYSTEM FAIL-URE.—By pulling emergency booster control (13, figure 3), booster system will operate on main system pressure.
 - (2) MAIN SYSTEM PRESSURE FAILURE.

Note

Turn auto-pilot "OFF".

Turn auxiliary booster shut-off control (26, figure 3) "OFF". Operate surface controls manually. Controls are very heavy and there is a slight amount of cable stretch. Use trim tabs as much as possible.

- (3) BRAKE SYSTEM FAILURE.—If main system fails to operate brakes, pull up brake emergency control (14, figure 3) and use hand pump (14, figure 13).
- (4) LANDING GEAR FAILURE.—Place the landing gear control (12, figure 3) in "DOWN" position and pull up emergency up-latch release control (2, figure 13). The landing gear will "free fall" approximately 2/3 down. Crank the landing gear down the rest of the way by using the emergency landing gear hand crank (12, figure 13). The crank is inserted in the two holes on the left wall. These holes are marked "LEFT" and "RIGHT" (landing gear). A rod to be used for manual engagement of the tail gear down-latch is stowed in the aft bulkhead of the main cabin. To engage the tail gear down-latch, extend the rod through the access opening in the aft bulkhead, place the hook around the folding tail gear strut near the joint, and pull the strut into engagement with the down-latch.
- (5) WING FLAPS EMERGENCY OPERA-TION.—Use hand pump. On airplanes prior to AF42-96803 pull the main accumulator shut-off valve (8, figure 5) to the "CLOSED" position before using hand pump.

i. ELECTRICAL SYSTEM FAILURE.

If the generator system fails, use the auxiliary power unit. If the unit does not operate and the generator system is out, all electrical units in airplane operate off the batteries. Therefore, shut down all unnecessary equipment.

j. OXYGEN SYSTEM FAILURE.

When main system fails, use walk-around cylinders and get below 15,000 feet.

3. FORCED LANDING PROCEDURE.

a. OVER LAND.

- (1) Jettison all possible equipment.
- (2) Unless exceptionally good terrain is offered, land with landing gear up.
- (3) Have crew and passengers assume crash positions.
- (4) Use flaps, and land with minimum safe airspeed.
 - (5) Use power if available.
- (6) Open all emergency exits prior to impact to avoid jamming.

Note

Do not feather props.

b. OVER WATER.

(1) DITCHING.

- (a) Check all emergency equipment before each long overwater flight.
- (b) Preparations for ditching should always be made while enough fuel remains for a power landing. Pilot warns crew prior to ditching and crew must acknowledge.
- (c) Transmit on command and liaison radios to contact other airplanes, surface craft, or shore stations when existing orders permit.
- (d) Jettison all possible equipment and cargo. No means is provided for jettisoning fuel. Emergency exits should be opened prior to landing as the landing impact may jam them if they are closed.
- (e) All crew members must have life vests on and safety belts fastened. All personnel take assigned crash stations. Do not inflate life vest until after leaving airplane.

- (f) Keep approach speed well above stalling and land in tail down position.
- (g) In winds below 30 mph, land along the swell in a trough; in winds above 30 mph, land as near into the wind as possible and angle onto the up-slope of the swell. Hold airplane off and land as slowly as possible.
- (b) LAND WITH LANDING GEAR UP. Landing with landing gear down would probably cause the airplane to turn over.
- (i) Use of flaps is optional. In a smooth sea, the higher stalling speed may be less dangerous than the possibility of nosing over due to extended flaps. In a rough sea, the lower stalling speed may outweigh the danger of landing with flaps extended. When landing is made with flaps down, the flaps should be retracted just before contact is made with the water. Turn ignition switches (15, and 18, figure 7) "OFF" just prior to contact with the water.

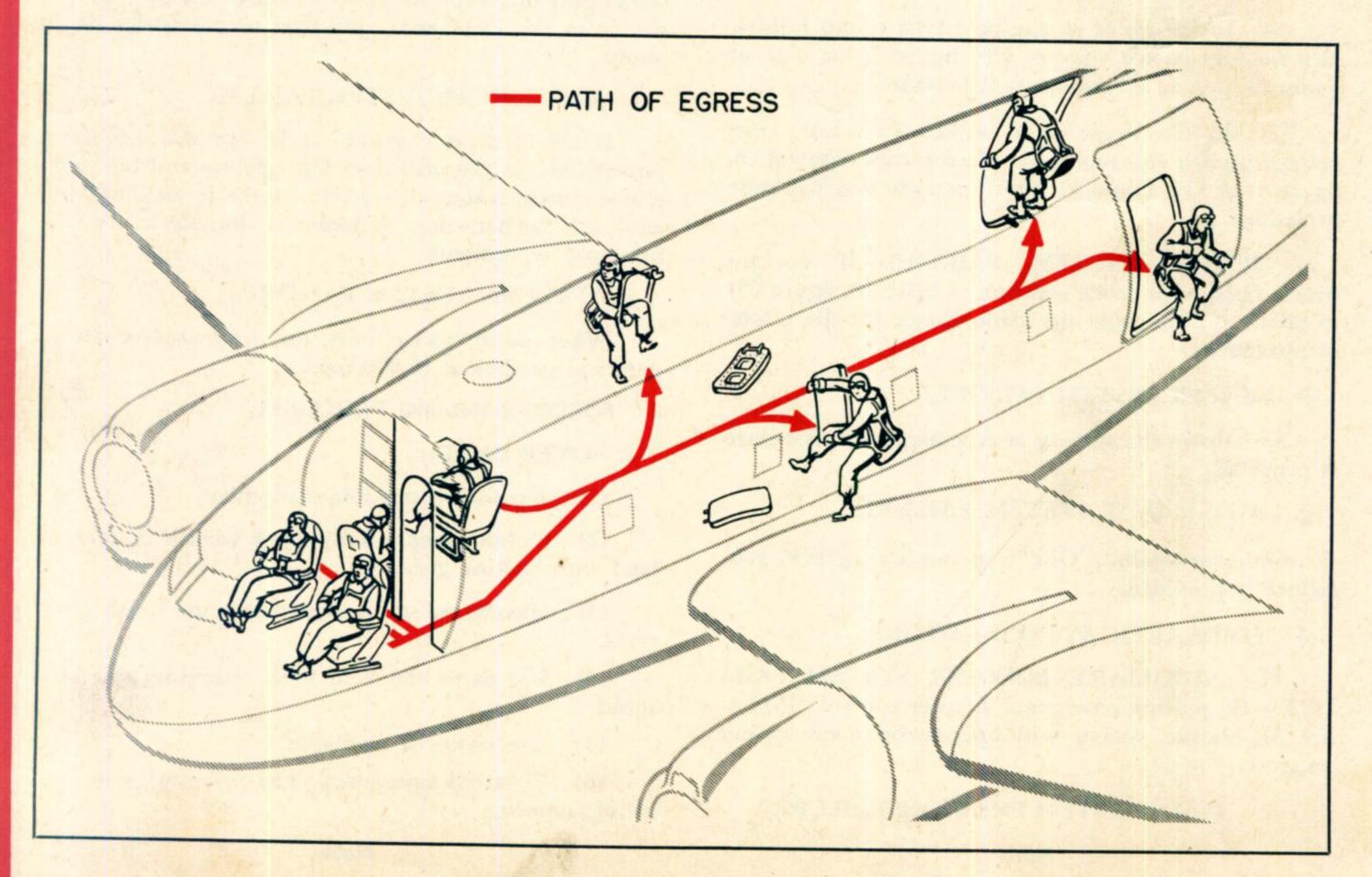


Figure 14-Emergency Exits

(2) DITCHING AT NIGHT.

- (a) Turn on all exterior lights to assist in landing and to attract search parties.
- (b) To tell the height of the airplane above the water, lower the trailing antenna and close the transmission key. The current on the ammeter will drop as soon as the antenna touches the water.

(3) LIFE RAFTS.

- (a) The life rafts are stowed in canvas containers which are closed with snap fasteners. The rafts are held in their stowed position by straps and may be quickly released by pulling out on the locking dogs of the straps.
- (b) The airplane may be kept afloat by inflating life rafts within the airplane. To keep the airplane balanced, two inflated rafts should be placed at the forward end of the cabin for each one aft.

4. PYROTECHNICS.

A signal pistol is stowed in a case support on the left of the pilot's compartment just above the data case and should be taken along when leaving the airplane.

5. PORTABLE EMERGENCY RADIO TRANSMITTER SCR-578-A.

- a. This radio is located directly over emergency escape hatch on right side of main cabin. The set is water-proofed. Complete instructions are contained on the transmitter. When airplane has been ditched, remove emergency set with the life rafts.
- b. When dropping emergency transmitter (when airplane is abandoned or in rescue work), altitude should be between 300-500 feet. Tie the static line to any solid metal structural part of the airplane before throwing transmitter out and make sure the static line will not foul.

6. FIRES.

a. ENGINE FIRES.

- (1) Shut off gas to burning engine.
- (2) Mixture control "AUTO-RICH".
- (3) Both propellers 2400 RPM.
- (4) Both throttles 42 in. Hg.

- (5) Both cowl flaps "OPEN".
- (6) Feather burning engine when it quits.
- (7) Pull fire extinguisher control.
- (8) Mixture control "IDLE CUT-OFF" on dead engine.
- (9) Pull up hydraulic booster if left engine is dead.
- (10) Hydraulic suction valve under tank "CLOSED".
 - (11) Switch off dead engine.
 - (12) Cowl flaps as needed for good engine.
- b. NACELLE FIRES. Turn fuel selector valve "OFF". Pull required fire extinguisher release handle located beneath instrument panel. Never lower landing gear with nacelle on fire.

When either fire extinguisher release handle is pulled, it will completely empty the system for that engine.

c. WING FIRE.—Turn all switches controlling landing and navigation lights "OFF".

d. FUSELAGE FIRE.

- (1) Close all windows.
- (2) If an electrical fire, turn main switches "Off".
- (3) If a leaking fuel or oil line, shut off closest valve on supply line.
- (4) If fuel, oil or other similar combustible liquids are involved, use hand Carbon Dioxide Extinguisher.

Refer to Fig. 13 for location of hand fire extinguishers.

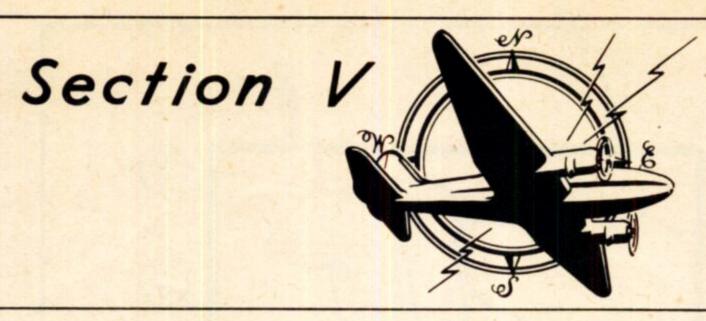
CAUTION

When operating the CO: extinguisher, it should be noted that the white discharge is "dry ice" and care should be taken to avoid frost-bite.

WARNING

When operating the carbon tetrachloride fire extinguisher, stand as far as possible from the fire. The combination of fire and carbon tetrachloride produces phosgene. Open as many doors and windows as possible immediately after use.

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OPERATIONAL EQUIPMENT

COMMUNICATION EQUIPMENT.

a. DESCRIPTION.

Note

For effectivity designation and location of radio installations, see figure 15.

- (1) COMMAND RADIOS.—There are two command radio sets: type SCR-522-A, providing push-button selection of frequency bands (used for very high frequencies), and type SCR-274-N with dial selection.
- (2) RADIO COMPASS.—Most airplanes are equipped with two radio compass installations, a type MN26-C with a manually adjustable loop and a type SCR-269-G having automatic bearing indication. Some airplanes are provided with a second SCR-269-G radio. (On later airplanes SCR-269-G radio is replaced by AN/ARN-7 radio; operation identical).
- (3) LIAISON RADIO.—Type SCR-287-A radio is provided for more extended range of operations.
- (4) FREQUENCY METER.—Type SCR-211; used to assist in establishing frequencies of liaison transmitter BC-375.
- (5) INTERPHONE SYSTEM.—Type RC-36; includes seven interphone stations.
- (6) RADIO ALTIMETER.—Type APN-1, a two-range altimeter (0-400 ft and 400-4000 ft), indicates altitude above terrain.
 - (7) MARKER BEACON.—Type BC-43.
- (8) LOCALIZER (type RC-103A) and GLIDE PATH (type ARN-5) radios. These provide vertical and horizontal indication for landing.

b. GENERAL INSTRUCTIONS.

- (1) If the airplane is on the ground, place battery selector switch(es) (19, figure 16) "ON", and master switch (17, figure 16) "ON".
- (2) When using an external source of power, turn the battery selector switches "OFF", and place master ignition switch "ON".
- (3) When operation of the SCR-269 or ARN-7 radio compass sets is desired, turn "ON" the AC inverter switch (18, figure 16).
- (4) Radio operator and navigator may operate command sets or radio compasses by conventional use

of the interphone jack box after operating adjustments have been made by pilot personnel.

c. COMMAND SET SCR-274-N.

- (1) RECEIVING (See 27, figure 16.)
 - (a) Jack box at "COMMAND".
 - (b) Filter box at "BOTH".
 - (c) Set "AB" switches at "A".
- (d) "CW-OFF-MCW" (28, figure 16), set for type of reception desired.
 - (e) Jack box volume full "ON".
 - (f) Receiver volume full "ON".
 - (g) Tune receiver.

Note

Control headset volume with receiver volume control.

WARNING

Volume on the SCR 274N radio is considerably reduced if operated simultaneously with certain SCR 522 receiver equipment. This applies on airplanes having high impedance output; (that is, with headset adapters installed).

(2) TRANSMITTING (See 26, figure 16.)

- (a) Set command switch (20, figure 16) to "SCR-274".
- (b) "TRANS. POWER" switch (24, figure 16) "ON".
- (c) "TRANSMITTER SELECTOR" switch (23, figure 16) at desired channel.
- (d) "TONE-CW-VOICE" switch (25, figure 16), to "VOICE".
- (e) Operate press-to-talk button for voice communication.

d. COMMAND SET SCR-522-A.

(1) RECEIVING.

- (a) Circuit breaker switch (5, figure 20)
 - (b) Jack boxes at "COMMAND".
 - (c) Filter box at "BOTH".
- (d) Push button on control box for desired channel.
 - (e) Control volume with jack box.

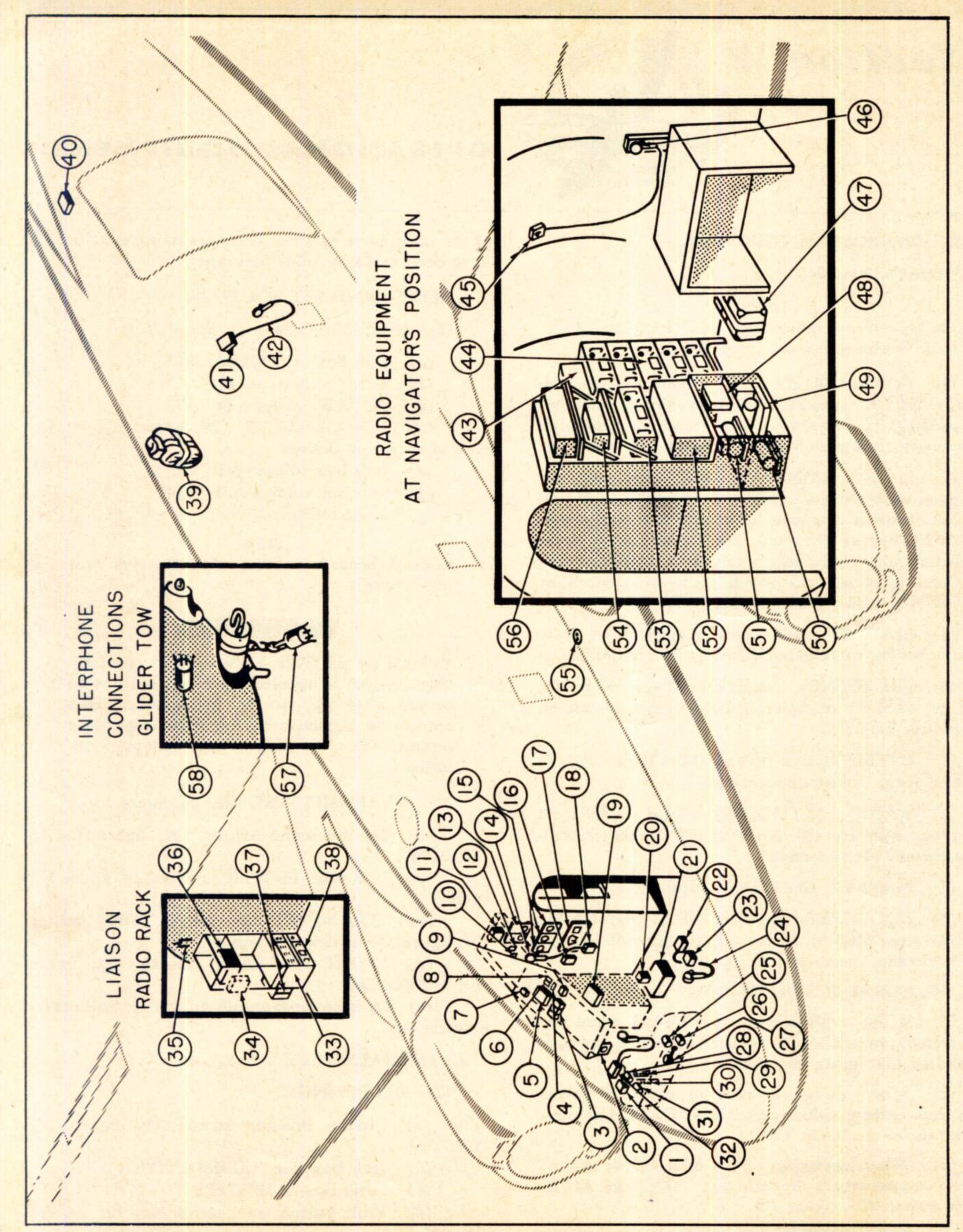


Figure 15-Communications Equipment

1. Filter Box (Co-Pilot's Interphone)

2. Altitude Limit Switch (Radio Altimeter APN-1) Airplanes AF44-77444 and Up

3. Receiver Control Boxes (SCR-274-N Radio)

4. Command Radio Control Switch (Airplanes AF42-96803 and Up)

5. Control Panel (SCR-269-G Radio Compass)

- 6. "CW-VOICE" Switch (SCR-269-G Radio Compass)
- 7. Control Box, Localizer (RC-103A) and Glide Path (ARN-5) Radios (Airplanes AF44-77444 and Up)

8. ZB "ON-OFF" Switch (ARR-1 Radio)

9. SCR-274-N Transmitter Control Box

10. SCR-522 Circuit Breaker

11. Antenna Relay for Command Set SCR-274-N

12. Monitor Switch

- 13. SCR-274-N Transmitter Units
- 14. Hand Microphone, (Radio Operator's)

15. SCR-274-N Receiver Units

16. Reel Control Box BC-461 (Trailing Wire Antenna)

17. Liaison Receiver BC-348

- 18. Interphone Box, (Radio Operator's)
- 19. Control Panel (MN-26-C Radio) Airplanes AF42-96803 and Up
- 20. Marker Beacon (BC-43) Control Box
- 21. SCR-269-G Radio Compass Unit
- 22. Filter Box (Pilot's Interphone)
- 23. Jack Box (Pilot's Interphone)

24. Hand Microphone

- 25. Localizer RC-103 Indicator
- 26. Left-Right Indicator (MN-26-C Radio) Airplanes AF42-96803 and Up

27. Azimuth Indicator (MN-26-C Radio) Airplanes AF42-96803 and Up

- 28. Compass Indicator (SCR-269-G and ARN-7 Radio Compasses)
- 29. Control Box, SCR-522 Radio, Airplanes AF42-96803 and Up
- 30. Indicator Lights, Radio Altimeter APN-1, Airplanes AF44-77444 and Up
- 31. Range Switch, Radio Altimeter APN-1 Airplanes AF44-77444 and Up
- 32. Jack Box (Co-Pilot's Interphone)
- 33. Liaison Transmitter (BC-375)
- 34. Control Panel (2nd Radio Compass SCR-269-G)
- 35. Antenna Selector Switch (Liaison Radio-SCR-287-A)

36. Antenna Tuning Unit (BC-306-A)

- 37. Localizer (RC-103 and Glide Path (ARN-5) Units, Airplanes AF44-77444 and Up)
- 38. Transmitter Tuning Unit (Liaison Radio SCR-287-A)

39. Life Raft Radio (SCR-578-A)

- 40. Jumpmaster's Interphone Box (used with Throat Microphone)
- 41. Cargo Door Interphone Box (Airplanes AF44-77444 and Up)

42. Hand Microphone T-17

- 43. APN-1 Radio Altimeter Unit
- 44. Spare Tuning Units (Liaison Radio-SCR-287-A)

45. Interphone Jack Box

- 46. T-17 Microphone
- 47. Frequency Meter SCR-211

48. Interphone Amplifier

49. Modulator (Command Set SCR-274-N)

50. Dynamotor (Interphone)

- 51. Dynamotor (Liaison)
- 52. Transmitter-Receiver Unit (SCR-522 Installation)
- 53. Tuning Unit (Spare)-Liaison Radio-(SCR-287-A)

54. Dynamotor (SCR-522 Radio)

55. Interphone Station, Ground Crew

56. MN-26-C Radio Compass Unit

57. Interphone Connection (AF44-77444 to AF44-77893)

58. Interphone Connection (AF44-77894 and Up)

Note

If radio is inoperative, check circuit breaker.

(2) TRANSMITTING.

(a) "T-R-REM" switch on control box in "REM" position.

(b) To transmit, operate press-to-talk button.

Note

If the transmitter and receiver fail to operate when a channel push button is pressed on the radio control box, press another channel push button, then again push the button for the desired channel.

e. RADIO COMPASS SCR-269-G.

- (1) GENERAL.
- · (a) Battery switches "ON".
- (b) AC inverter "ON".
- (c) Select frequency band.
- (d) Volume full "ON".
- (e) Tune station on "ANT" position.

(2) TO USE RADIO COMPASS INDICATOR (See figure 16.)

- (a) Function switch to "COMP".
- (b) Retune station for maximum signal.
- (c) Reading on radio compass indicator will give bearing from aircraft to station.
 - (3) TO USE LOOP.
 - (a) Switch to "LOOP".
- (b) Rotate loop for maximum signal. (Push switch for low speed.)
 - (c) "VOICE-CW" switch on "CW".
- (d) Retune station to obtain high frequency beat.
 - (e) Obtain null.
- (f) Bearing from plane to station is read on radio compass dial.

Note

To eliminate heavy static, the maximum position of loop may be used for voice or range contact. (Function switch on "ANT" or "LOOP," "VOICE-CW" switch on "VOICE".)

f. RADIO COMPASS MN-26-C.

- (1) GENERAL.
 - (a) Battery switches "ON".
 - (b) AC inverter "ON".
 - (c) "ON-CW-OFF" switch "OFF".
 - (d) Volume full "ON".
 - (e) Select frequency band.
 - (f) Tune station on "ANT."

(2) TO USE LEFT-RIGHT INDICATOR.

- (a) Function switch at "COMP".
- (b) Rotate needle to zero.

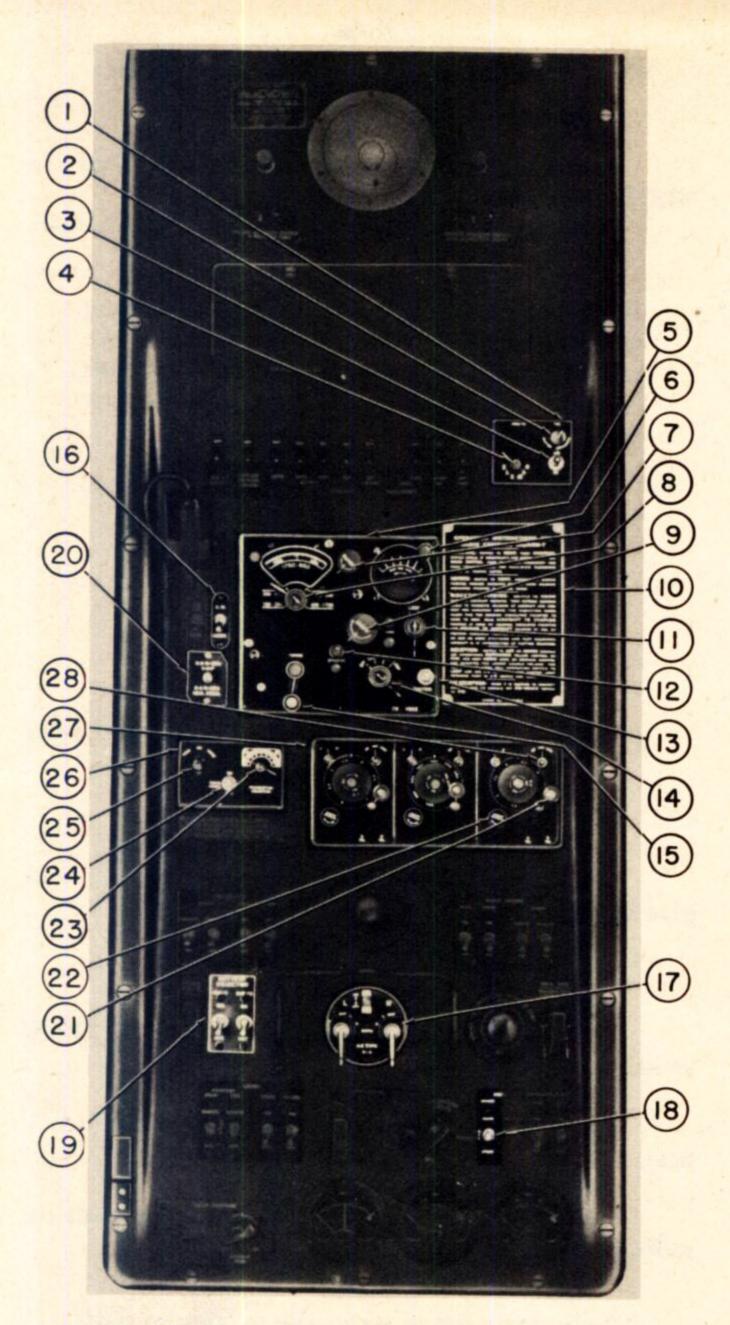


Figure 16-Radio Controls on Overhead Panel

LOCALIZER AND GLIDE PA TH RADIOS

- 1. Localizer Control Box (AF41-24740 and Up)
- 2. Volume Control Knob
- 3. "ON-OFF" Switch
- 4. Frequency Selector Switch

RADIO COMPASS CONTROL PANEL SCR-269-G (AF41-5159 through AF42-96806)

- 5. Control Panel
- 6. Tuning Meter
- 7. Dial Light Control 8. Frequency Band Selector
- 9. Volume Control
- 10. Operating Instructions
- 11. Loop Drive Control
- 12. Control Indicator Light
- 13. Control Switch (Not Used)
- 14. Function Control
- 15. Tuning Crank
- 16. "CW-VOICE" Switch

MISCELLANEOUS SWITCHES

- 17. Master Switch
- 18. Inverter Switch
- 19. Battery Selector Switches
- 20. Command Switch

COMMAND RADIO SCR-274-N RADIO

- 21. Tuning Control
- 22. "INCREASE OUTPUT" Control
- 23. "TRANSMITTER SELECTOR" Switch
- 24. "TRANS. POWER" Switch
- 25. "TONE-CW-VOICE" Switch
- 26. Transmitter Control Box
- 27. Receiver Control Box 28. "CW-OFF-MCW" Switch

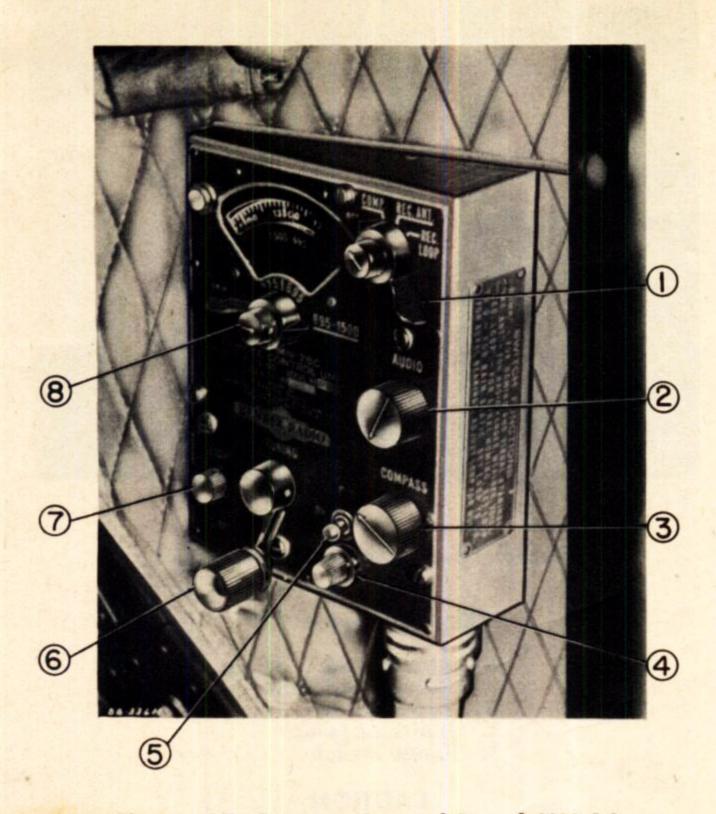


Figure 17—Remote Control Panel MN-26

- 1. Function Switch
- 2. Volume Control
- 3. "COMPASS" Knob
- 4. Fuse
- 5. "ON-CW-OFF" Switch
- 6. Tuning Crank
- 7. Dial Light Control
- 8. Frequency Band Selector
- (c) Adjust sensitivity of needle.
- (d) Turn with indicator.

(3) TO USE LOOP.

- (a) Function switch at "LOOP".
- (b) "ON-CW-OFF" switch "ON".
- (c) Rotate loop to obtain maximum signal.
- (d) Retune station to obtain maximum beat.
- (e) Rotate loop to obtain null.

Note

The radio compass has automatic volume control and should not be used for range orientation.

g. OPERATION OF LIAISON SET SCR-287-A.

Note

Battery switches "ON" and jack box at "LIAISON" prior to all operations.

(1) RECEIVING.

(a) RANGE.

- 1. "OFF-AVC-MVC" switch "MVC".
- 2. Select band and tune station.

- (b) VOICE COMMUNICATION (Pilot and Radio Operator).
 - 1. "OFF-AVC-MVC" switch "AVC".
 - 2. Select band and tune station.

(c) CODE.

- 1. "OFF-AVC-MVC" switch "AVC".
- "CW OSC" switch "ON", "BEAT FREQ" control for desired pitch, "CRYSTAL SWITCH" as desired.
 - 3. Select band and tune station.
- 4. Tune "ANT. ALIGN" control for maximum signal.
- 5. To receive a modulated signal, turn "CW-OSC" switch off.

Note

If noise and interfering signal reduction is desired, turn the "CRYSTAL" switch "IN" making any tuning adjustments necessary.

(2) TRANSMITTING.

- (a) VOICE COMMUNICATION (Pilot and Radio Operator).
- 1. Transmitter tuning unit (38, figure 15) selected by radio operator.
- Throw knife switch to select trailing-wire antenna or fixed antenna, as desired.

Note

Trailing wire antenna should not be used if airspeed exceeds approximately 160 mph.

- 3. "TRANS. POWER" switch (5, figure 18)
- "ON".

 4. "TONE CW VOICE" switch on "VOICE".
- 5. Monitor the transmitting frequency switch (6, figure 20) using receiver BC-348.
 - (b) CODE (Radio Operator).
 - 1. Select tuning unit for desired frequencies.
 - 2. "TRANS. POWER" switch "ON".
- 3. Knife switch to select trailing wire antenna or fixed antenna.
- 4. "TONE-CW-VOICE" switch (2, figure 18) at "CW".
- 5. Monitor the transmitting frequency switch using receiver BC-348.

b. OPERATION OF INTERPHONE RC-36.

- (1) "TRANS. POWER SWITCH" (24, figure 16) "ON" (Airplanes through AF42-107374 ONLY.)
- (2) In the event of interphone amplifiers' failure, place channel selector switch on command transmitter control box in either "3" or "4" position and interphone jack box selector switches in "COM-MAND" position. (It is impossible to communicate with ground stations or other aircraft in this position.)

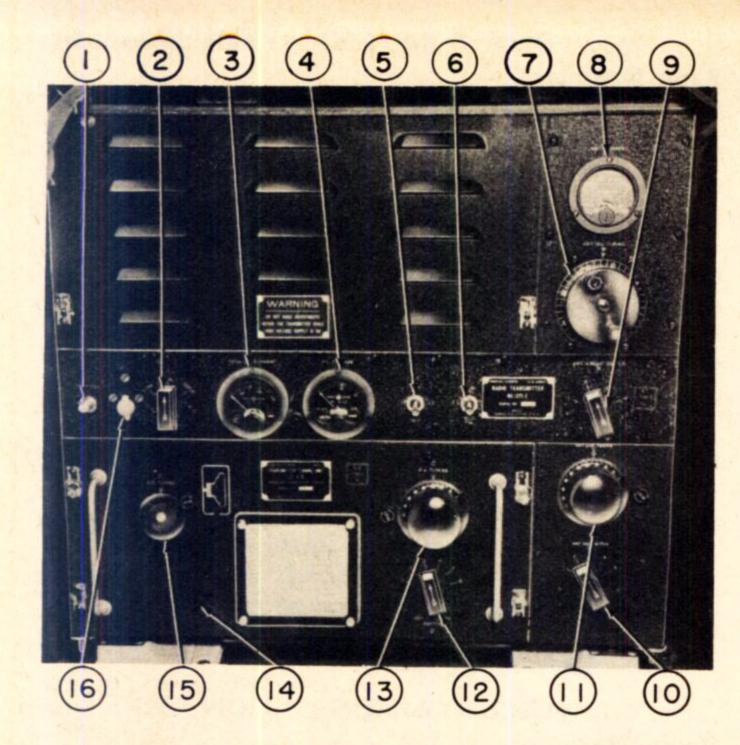


Figure 18—Liaison Transmitter BC-375-E

- 1. Test Key
- 2. "TONE-CW-VOICE" Switch
- 3. Total Plate Current Meter
- 4. Filament Voltmeter
- 5. "TRANS. POWER" Switch
- 6. "CW" Filament-Mod. Filament Switch
- 7. Antenna Inductance Tuning Control "M"
- 8. Antenna Current Meter
- 9. Antenna Circuit Switch "N"
- 10. Antenna Inductance Switch "P"
- 11. Antenna Capacitance Tuning Control "O"
- 12. Antenna Coupling Switch
- 13. P. A. Tuning Control
- 14. Transmitter Tuning Unit TU-()
- 15. M. O. Tuning Control
- 16. Calibration Reset Port
- (3) Interphone jack box increase out-put control does not function when selector switch is in either IN-TER" or "CALL" position.

i. APN-1 RADIO ALTIMETER.

(1) OPERATION.

(a) Set "RANGE" switch for required range. USE LOW RANGE BELOW 400 FEET, HIGH RANGE ABOVE 400 FEET. Any change of range should be made at an altitude of approximately 400 feet.

CAUTION

THE HIGH RANGE IS NOT CALIBRATED FOR ALTITUDES BELOW 400 FEET.

- (b) Set altitude limit switch for desired preset altitude.
- (c) Turn power switch "ON". After allowing approximately one minute for tubes to heat, altitude indicator will show a change indicating equipment is operating.

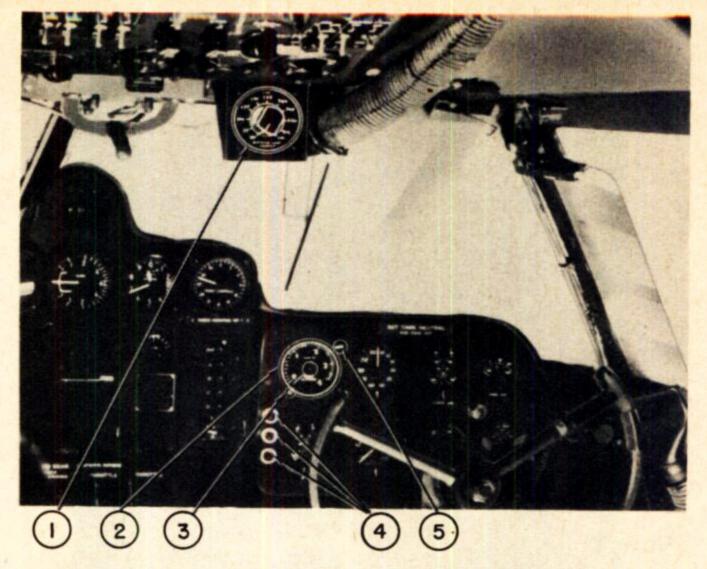


Figure 19-Radio Altimeter APN-1

Key to Figure 19

- 1. Altitude Limit Switch
- 2. Altitude Indicator
- 3. Power Switch
- 4. Indicator Lamps
- 5. Range switch

CAUTION

When the airplane is standing still or taxiing, the altitude indicator may not necessarily read "zero" with equipment operating. Never attempt to adjust indicator to obtain zero reading.

(d) Note indicator lamp glow: red if below desired altitude; green if above; or amber if desired altitude is reached.

j. OPERATION OF MARKER BEACON RE-CEIVER RC-43.

- (1) Turn radio compass SCR-269-G "ON". It supplies power for operation of the marker beacon receiver.
- (2) When flying over an airway fan marker, Z (cone of silence) marker, (indicated on Radio Facility Chart) or instrument landing marker, the indicator light (figure 6) will glow.

k. LOCALIZER (RC-103) AND GLIDE PATH (ARN-5) RADIOS.

(1) OPERATION.

- (a) Turn "ON-OFF" switch (3, figure 16) to "ON" position approximately 20 minutes before landing gear is lowered, allowing receiver to warm up.
- (b) Turn frequency selector switch (4, figure 16) to desired position which must be known by consulting radio facilities charts or by communication with ground.

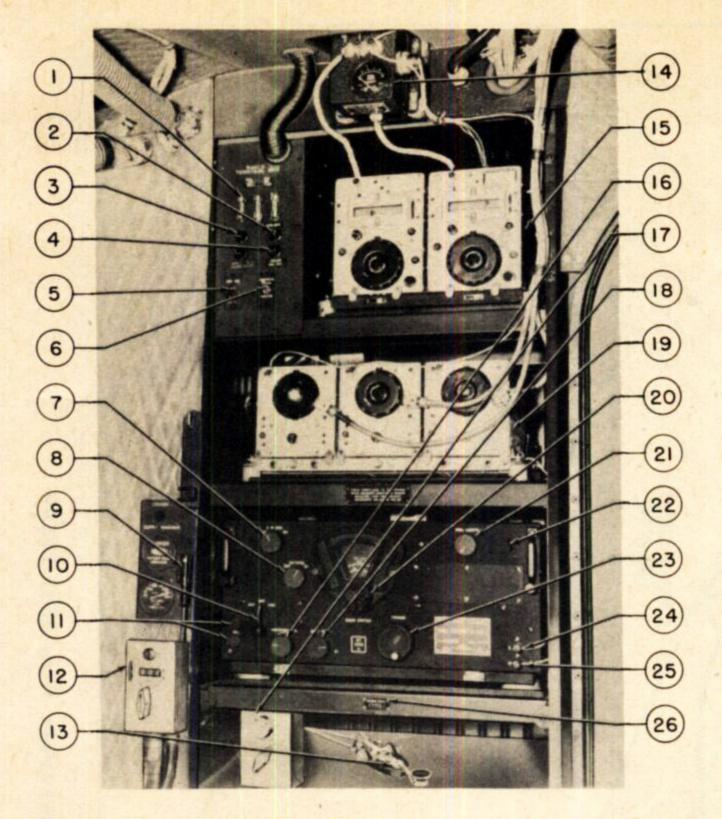


Figure 20-Equipment Rack Above Radio Operator's Table

- 1. Spare Fuse (Typical) SCR-274-N Installation
- 2. Circuit Fuse (SCR-695 Radio)
- 3. Circuit Fuse (RC-103 Radio)
- Mic. Circuit Fuse (SCR-522-A Radio)
 Circuit Breaker Switch (SCR-522-A Radio)
- 6. Monitor Switch
- 7. "C. W. OSCILLATOR" Switch
- 8. Crystal Filter Switch
- 9. Disconnector Cord for Radio Operator's Head Set
- 10. Power "OFF-AVC-MVC" Switch
- 11. "TEL" Phone Jacks
- 12. Reel Control Box, Type BC-461, for Trailing Wire Antenna
- 13. "C. W." Key
- 14. Antenna Relay (Command Set, SCR-274-N)
- 15. Transmitters (Command Set, SCR-274-N)
- 16. Volume Control
- 17. Interphone Jack Box, Type BC-366
- 18. Beat Frequency Adjustment
- 19. Receivers (Command Set, SCR-274-N)
- 20. Band Selector Switch21. Dial Lights Control
- 22. Liaison Receiver BC-348-().
- 23. Tuning Crank 24. Antenna Post
- 25. Ground Post 26. Radio Call Plate
- (c) Interphone box selector at "COMMAND" position.
- (d) Adjust volume by means of increase volume control knob (2, figure 16) on radio control box.
- (e) Observe pointers on the indicator (figure 6). One pointer attains true horizontal position to indicate correct angle of glide. The other indicates center of runway when its most vertical position is reached.

2. OXYGEN SYSTEM.

a. GENERAL.—Most C-46 airplanes are equipped with a demand-type crew oxygen system. The later airplanes are also equipped with an automatic continuous flow-type troop oxygen system. Early airplanes are equipped with a continuous flow type crew oxygen system only. See figures 21, 22, 23 and 24 for effectivity designation.

The following table indicates approximate duration in hours of both crew systems for a crew of four:

MAN-HOUR OXYGEN CONSUMPTION TABLE

Altitude in	Continuous	Demand
Thousand Feet	Flow System	System
10	12.7	14.9
15	10.7	15.1
20	9.2	15.4
25	7.7	. 8.8
30	6.3	9.0

Note

If crew is less than four, duration values will be increased proportionately.

The following table indicates approximate duration in hours of the troop oxygen system for 40 troops at 400 psi:

Altitude in	Duration
Thousand Feet	Hours
10	7.5
20	6
30	5

Note

If there are less than 40 troops, duration values will be increased proportionately.

b. CONTINUOUS FLOW OXYGEN SYSTEM.

- (1) GENERAL.—Location of equipment utilized by the continuous flow crew oxygen system is indicated in figure 21.
 - (2) CONTINUOUS FLOW REGULATOR— CREW SYSTEM. (Airplanes AF41-5159 through AF41-24689.)
- (a) The continuous flow oxygen regulator, type A-9A, controls the amount of oxygen delivered from the cylinders to the mouthpieces for a manually set altitude indication. The flow is graduated in accordance with the oxygen required at various altitudes and is so measured on the face of the regulator.
- (b) The other indicator on the regulator dial shows the oxygen supply pressure. Supply limits are 400 psi (fully charged) and 50 psi (empty).
- (c) To obtain proper oxygen flow, set indicator on gage to point to altitude at which airplane is flying.
- (d) On landing, make sure the regulator is turned "OFF".

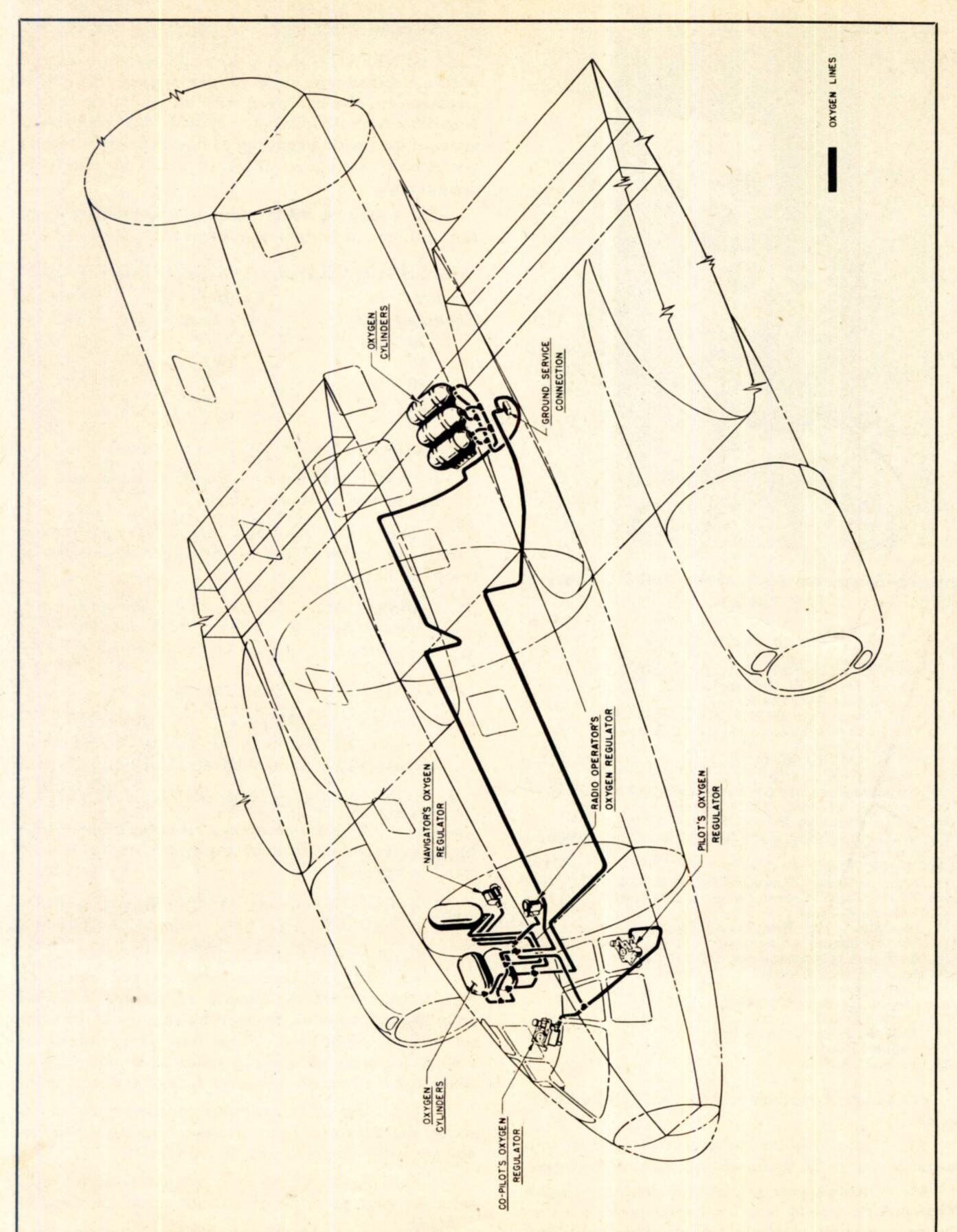


Figure 21-Continuous Flow Crew Oxygen System, Thru AF41-24689

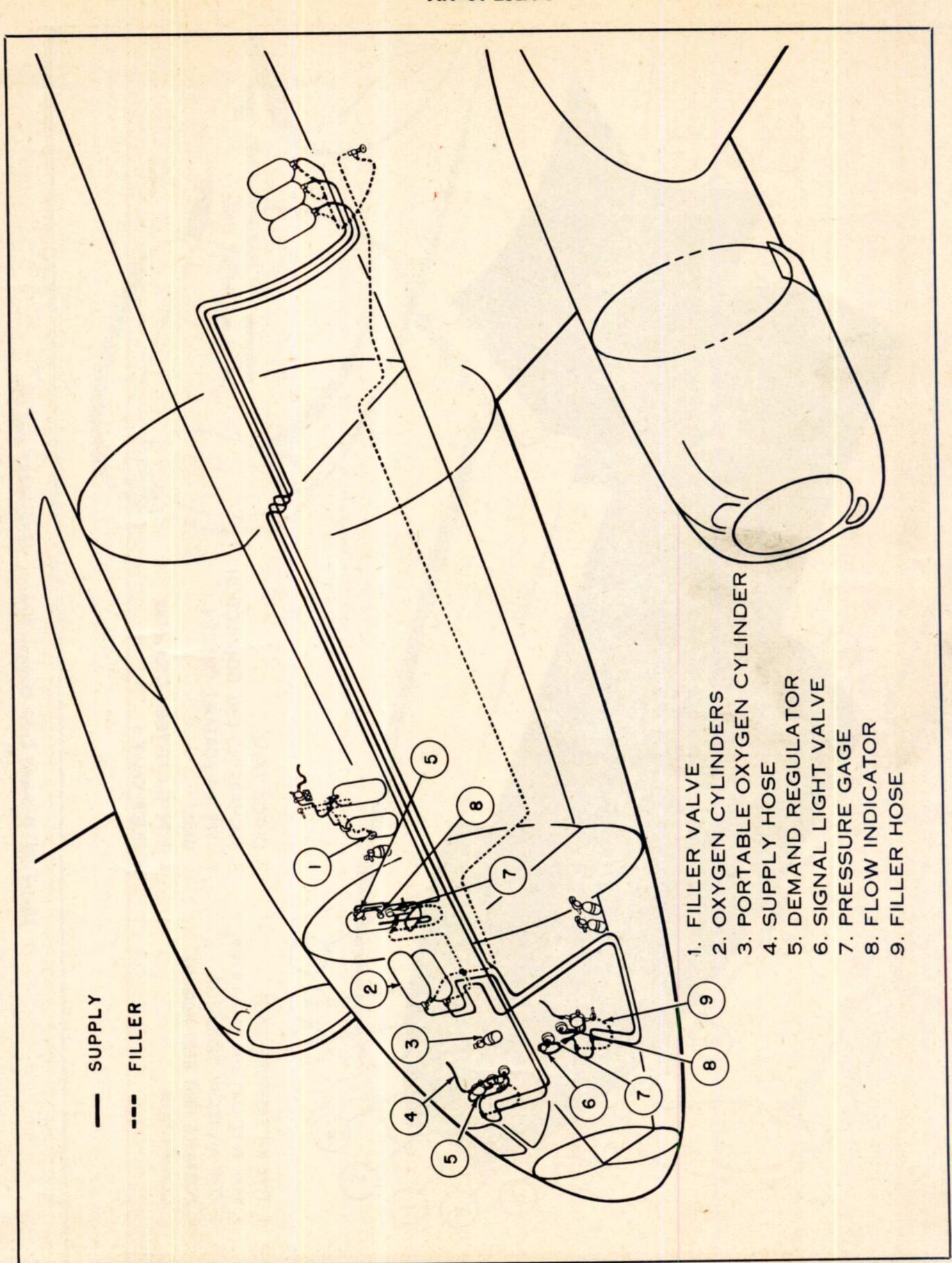


Figure 22-Demand Crew Oxygen System, AF41-24690 Thru AF42-96682

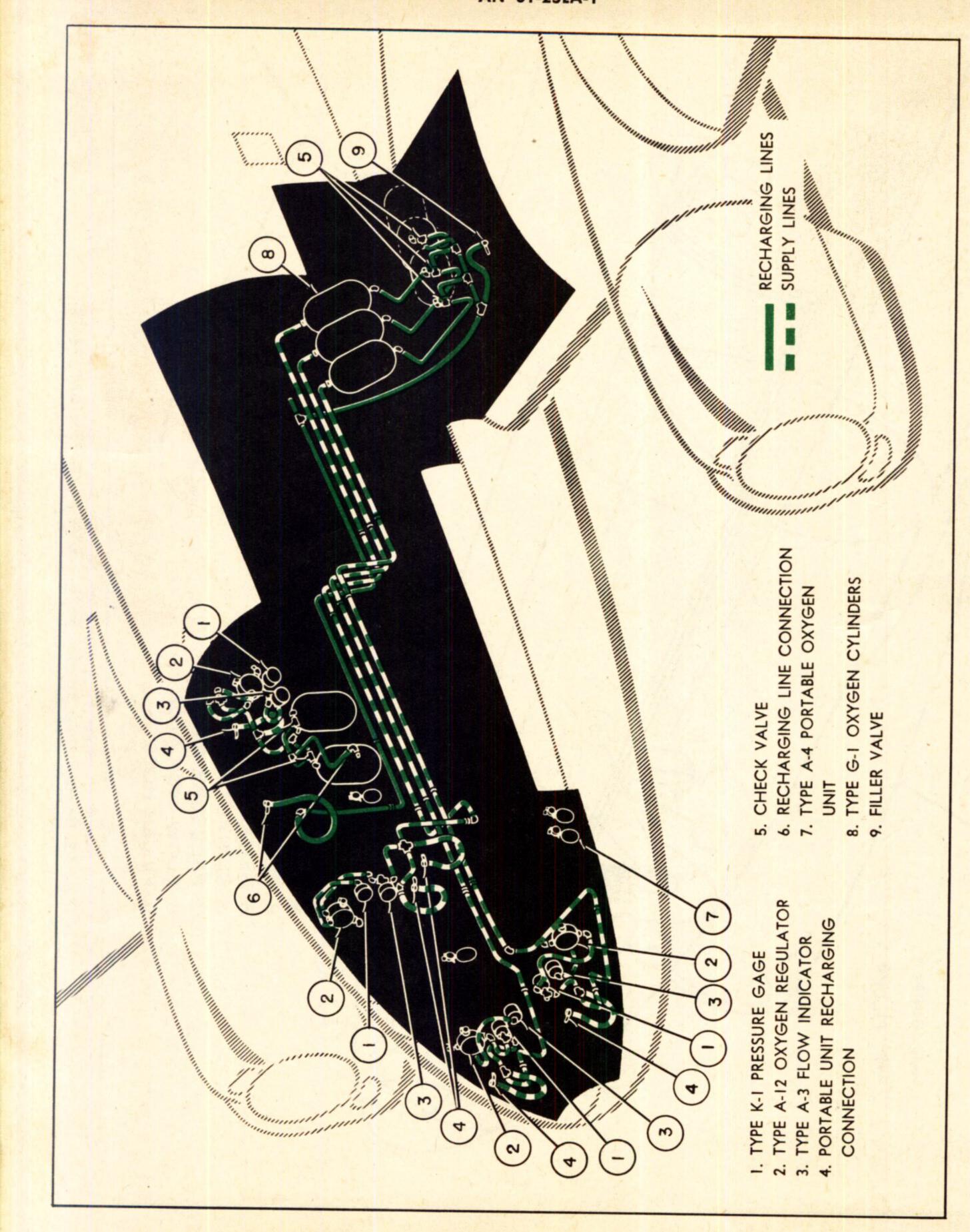


Figure 23-Demand Crew Oxygen System, AF42-96683 and Up

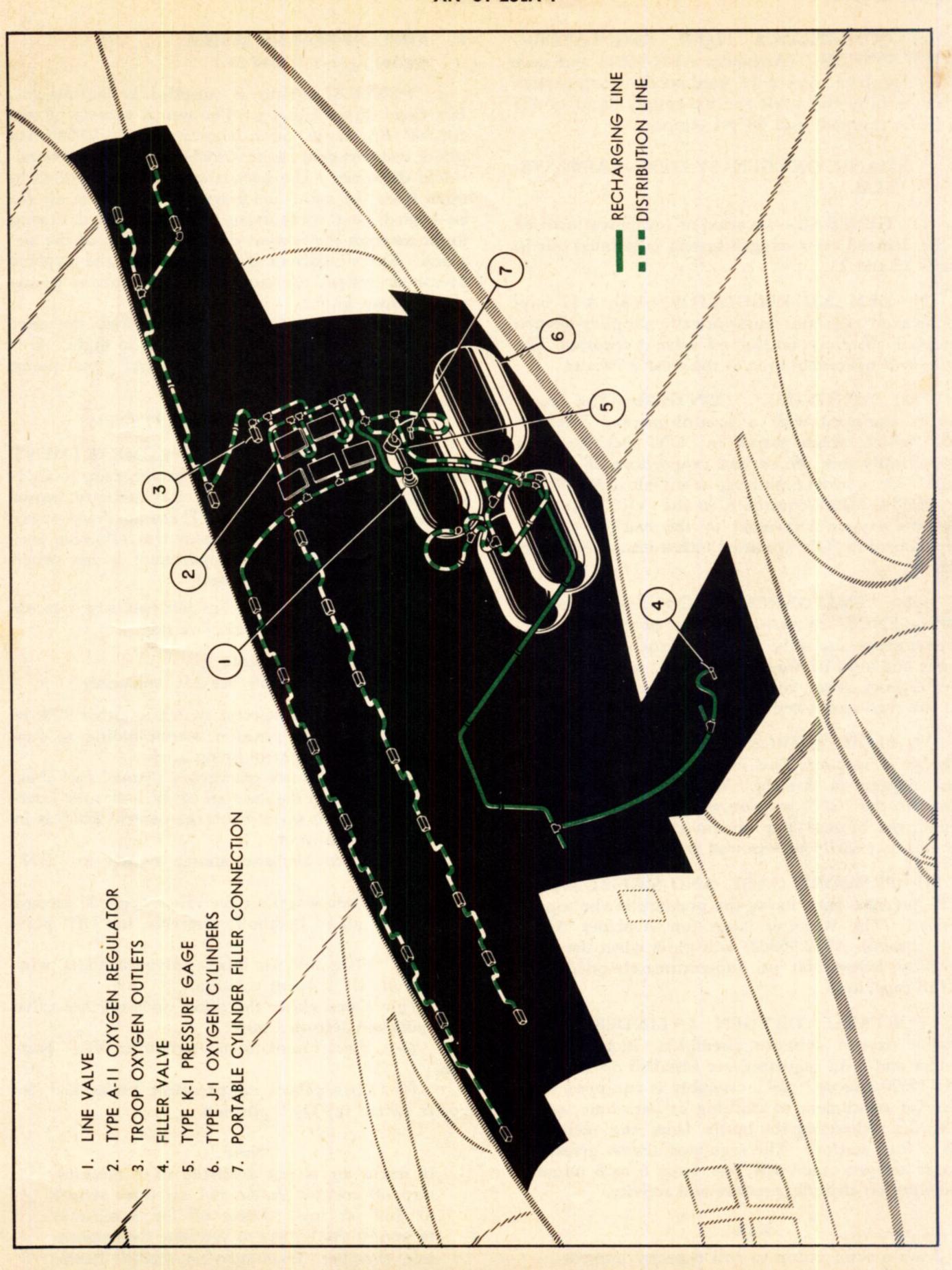


Figure 24-Troop Oxygen System, AF42-96803 and Up.

(3) CONTINUOUS FLOW REGULATOR—TROOP SYSTEM. (Airplanes AF42-96803 and up.)—This regulator, type A-11, used on the troop oxygen system, is fully automatic and has supply limits of 425 psi (fully charged) and 50 psi (empty).

c. DEMAND OXYGEN SYSTEM—CREW SYSTEM.

- (1) GENERAL.—Location of equipment utilized by the demand crew oxygen system is pointed out in figures 22 and 23.
- (2) DEMAND REGULATOR.—The A-12 oxygen demand regulator automatically supplies oxygen as needed, therefore, no shut-off valve is required. The system will operate as soon as the wearer inhales.
- (a) "AUTO-MIX" CONTROL.—The regulator is equipped with a control marked "AUTO-MIX" which, when placed in "ON" position, will automatically mix the correct proportions of air and oxygen for normal breathing at any altitude. When the "AUTO-MIX" control is in the "OFF" position, only pure oxygen is released to the mask as needed. Keep control in "ON" position unless instructed otherwise.
- (b) "EMERGENCY" CONTROL. An "EMERGENCY" control is installed on the regulator, for emergency use only. This control supplies pure oxygen and must be kept in the "OFF" position, unless an emergency arises, since it allows the oxygen to bypass the regulator when the "ON" position is used.
- (3) FLOW INDICATOR.—A type A-3 flow indicator is installed. This indicator blinks to indicate when oxygen is flowing. With the "AUTO-MIX" control in the "ON" position and the airplane on the ground, the blinker may remain closed since oxygen may not necessarily be required at that altitude.
- (4) PRESSURE GAGE AND SIGNAL LAMP.

 —The pressure gage shows the pressure in the supply cylinder. The warning lamp (on airplanes AF41-24641 through AF42-96802) will glow when the pressure drops below 100 psi (approximately one-fourth the full capacity).
- d. PORTABLE OXYGEN CYLINDERS.—Four portable oxygen cylinder assemblies, including the cylinder and A-13 regulator, are installed on airplanes AF41-24690 and up. Each assembly is equipped with a clip for attachment to clothing or parachute, and a fitting for recharging the bottle from the recharger hose at each station. The regulator always gives 100 percent oxygen and will last from 6 to 8 minutes depending on altitude, pressure and activity.

Note

Always refill bottle to full capacity immediately after use.

3. AIRPLANE HEATING SYSTEM.

(See figures 25 and 26.)

a. GENERAL.—Heat is supplied by Janitrol Surface Combustion Heaters. The system consists of two 100,000 Btu main cabin heaters and one 40,000 Btu pilots' compartment heater which also serves as a windshield defroster. The heaters utilize fuel supplied to them from the main fuel system. Ventilating air (to be heated) and combustion air are supplied during flight through the ram-air duct in the nose of the airplane. Electric current is supplied from the airplane 24-volt dc system, the auxiliary power unit or an external power source.

The pilots' compartment and windshield defroster heater may be used on the ground and in flight. It is equipped with a motor blower unit and a fuel pump for ground operation.

b. OPERATION OF HEATING SYSTEM.

- (1) STARTING PILOTS' COMPARTMENT HEATER.—Prior to starting the heater, plug in a 24-volt dc external power source, the auxiliary power unit, or run one of the engines. If the auxiliary power unit is employed, start it. Employ the following procedure to start the pilots' compartment heater when either in flight or on the ground.
- (a) Set either right or left fuel tank selector valve control to a tank containing fuel.

Note

For ground operation, use left tanks only.

- (b) Place fuel selector switch in either tank in right or left nacelle position corresponding to fuel tank selector valve control being used.
- (c) Open heater emergency manual fuel shutoff valve located on the floor aft of the hydraulic reservoir. The valve is open when the control knob is in the "DOWN" position.
- (d) Place airplane master switch in "ON" position.
- (e) Place warm air tee valve control, located on the floor aft of hydraulic reservoir, in "UP" position.
- (f) Place cold air intake valve on pilots' window sill in "UP" (open) position.
- (g) Open either the pilots' foot warmer valve or windshield defroster valve.
- (b) Place heater master switch in "ON" position.
- (i) Place pilots' compartment heater and defroster switch in "ON" position.

Note

If warm air is not available in 3 minutes, turn off cockpit heater and defroster switch to shut off fuel. Leave off for 3 minutes to permit the blower to ventilate the combustion chamber. Then turn on cockpit heater and defroster switch to restart.

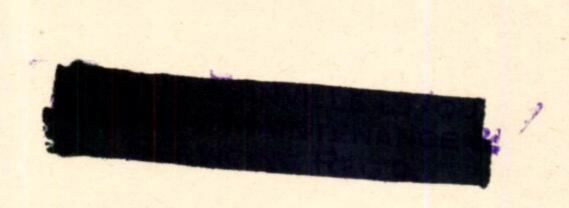
- (2) TO SHUT OFF PILOTS' COMPARTMENT HEATER.—Turn off pilots' compartment heater and defroster switch and wait 3 minutes before shutting off heater master switch. This interval permits heater to burn up the remaining fuel in the wick, and to ventilate and cool.
- (3) STARTING THE MAIN CABIN HEAT-ERS.—These two heaters may be operated separately or together, in flight only, and after the airplane has attained 120 mph IAS. When 120 mph IAS is attained, the rammed air creates sufficient pressure (no blower) to activate the air-pressure switch located in the intake duct.
- (a) Place "FUEL SELECTOR" switch in either right or left nacelle position, as desired.
- (b) Place emergency manual fuel shut-off valve in "DOWN" (open) position.
- (c). Place cold air intake valve in "UP" (open) position.
- (d) Place heater master switch in "ON" position.
- (e) If outside air temperature is below -18°C (0°F), hold fuel preheater switch "ON" for approximately 2 minutes.
- (f) Place one main cabin heater switch in "ON" position.

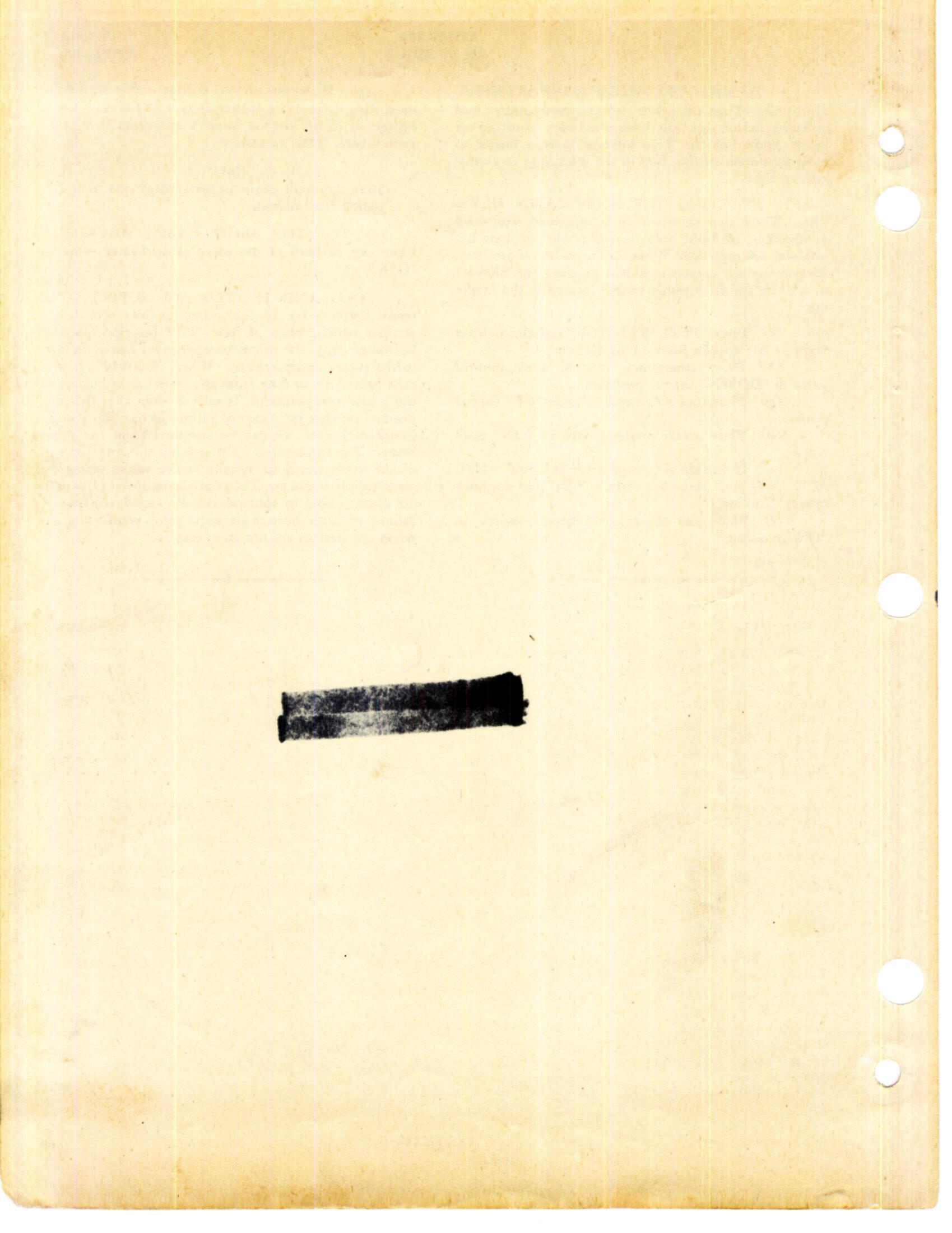
(g) If warm air is not available in 2 minutes, turn main cabin heater switch "OFF" and allow heater to drain for at least 3 minutes; then turn switch back "ON" to restart.

Note

Start the main cabin heaters before reaching 10,000 feet altitude.

- (4) TO STOP MAIN CABIN HEATERS.—Place one or both of the main cabin heater switches "OFF."
- c. COLD AND HEATED AIR SUPPLY.—The warm air tee valve in the warm air duct system is a damper which, when in the "UP" position, permits heated air from the pilots' compartment heater to flow to the pilots' compartment. When "DOWN", it permits heated air to flow from the main cabin heaters to the pilots' compartment. It will be seen that this is a protection; that is, in case of failure of the pilots' compartment heater, air can be supplied from the other heater. The three tubes leading from the forward end of the main warm-air system to the pilots' compartment supply warm air. The cold-air damper in the ramair duct is used to shut off the air supply in case of failure of both heaters or to control ventilating air when the heaters are not in operation.







EXTREME WEATHER OPERATION

1. WINTER OPERATIONS.

Note

Check AAF Form 263-B, "Aircraft Checkers' Report, Winterization Check List", located in the data case, for information applicable to the airplane when operating in cold climates.

a. COLD-WEATHER EQUIPMENT.

- (1) OIL IMMERSION HEATER.—Airplanes AF41-5159 to AF41-24739, AF44-77894 and up, can accommodate 750-watt filler-neck-type heaters. A 110-volt power source is required.
- (2) OIL COOLER FLAPS.—The flaps should be kept as nearly "CLOSED" as possible while maintaining oil temperatures between 60°C to 70°C.
- (3) WINDSHIELD WIPERS.—To operate the wipers, open the valve (6, figure 4).
- (4) PROPELLER ANTI-ICING SYSTEM.—This system is of conventional design. To operate, put circuit breaker switch (8, figure 7) "ON", and adjust rheostat switch (22, figure 7) to desired speed.
- (5) ANTI-ICING TANKS.—On airplanes AF41-5159 through AF41-12333, the propeller anti-icing fluid is supplied from a 4 US (3.3 Imperial) gallon tank. Anti-icing fluid for the carburetors and windshield is supplied from another tank with a capacity of 10 US (8.3 Imperial) gallons. On airplanes AF41-12334 and up, one tank with a capacity of 20 US (16.7 Imperial) gallons, divided into three compartments, supplies all anti-icing fluid. Use only anti-icing fluid Specification No. AN-F-13 in anti-icing systems. Drain all fluid from anti-icing tanks before going into combat areas.
- (6) WINDSHIELD DEFROSTERS.—Two removable windshield glass panels are stowed in a canvas container located on the main cabin wall above the toilet. These panels can be easily installed from the pilots' compartment by sliding the panels into the two retainers at the base of the windshield frame and locking the panel in place by the locking dog at the top center of the windshield. This provides a double windshield with an air space between the panels, into which two hot air ducts are directed to warm the

panels. The heat control is located on the left side of the control pedestal.

- (7) DE-ICER SYSTEM.—This system is conventional. To operate it, put circuit breaker switch (7, figure 7) in the "ON" position.
- (8) ENGINE COVERS.—Engine covers are provided for covering the cowl back to the firewall and are stowed in the accessory compartment. Outlets are provided in the covers for ground heating.
- (9) OIL COOLER DISCS.—Plywood discs are provided for installation on the oil coolers for restricting the flow of air through the center core tubes of the coolers. The discs are stowed in the lower forward cargo compartment.
- (10) AIRPLANE HEATING SYSTEM. (See figure 25.)

b. PROCEDURE PRIOR TO FLIGHT.

(1) GENERAL.—In very cold weather, the engine, accessory sections, and pilots' compartment should be preheated before starting engines. (Refer to paragraph 1., g. of this section for ground heating procedure.)

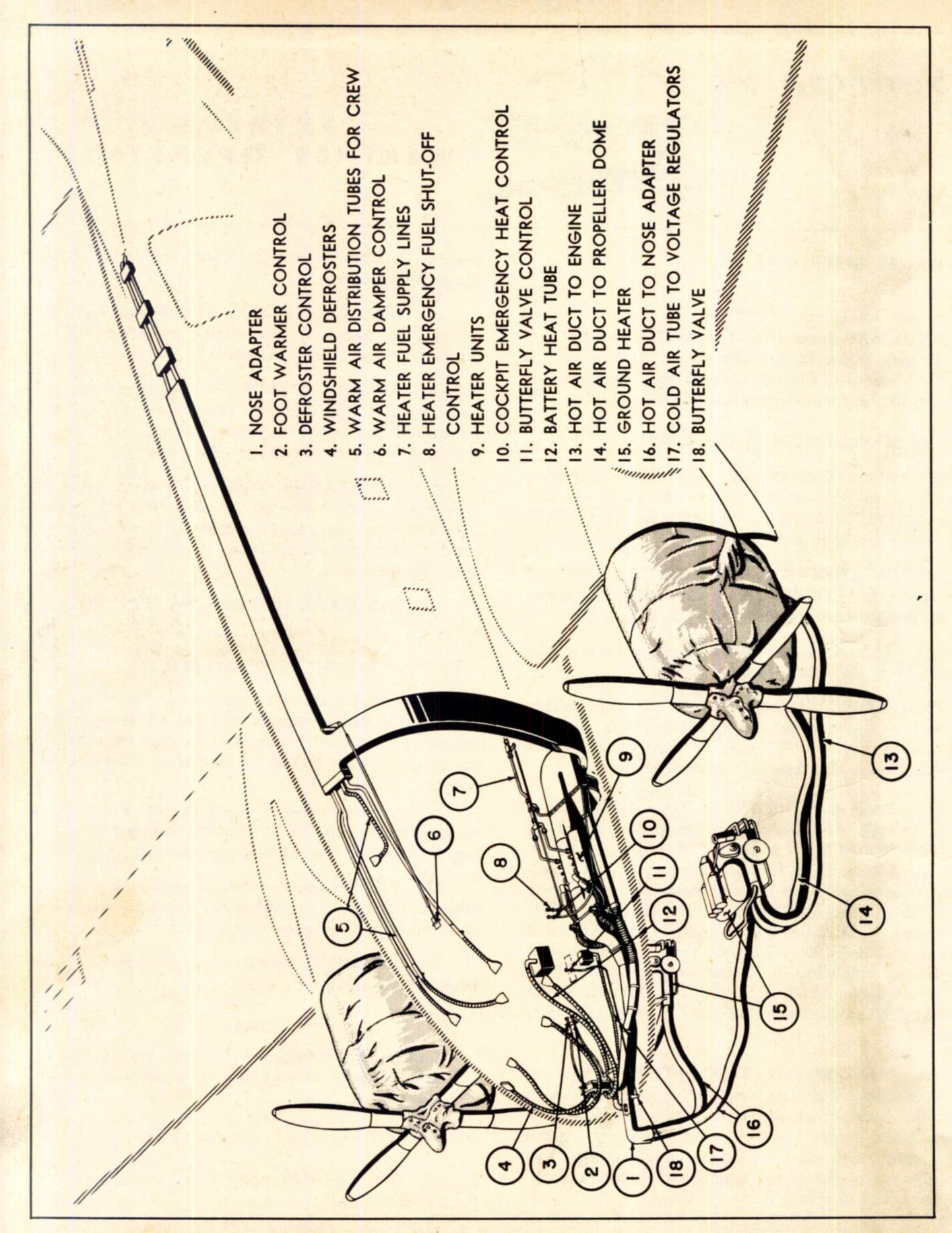
If ice, frost or snow is present on the airplane wing or flight surfaces, it must be removed by brushing, flushing, or heating prior to take-off.

- (2) PROPELLERS.—Pull propellers through approximately 16 blades. The force required should not be more than in normal temperature.
- (3) LANDING GEAR.—Clean off landing gear with hydraulic oil and a rag.

Note

Immediately after take-off, extend and retract landing gear several times to clean out mud and water.

- (4) TIRES.—Check inflation daily.
- (5) OIL SYSTEM.—Drain "Y" cock to see if oil is coming through.
- (6) FUEL SYSTEM.—Drain water from all sump drains.



igure 25-Airplane Heating Equipment

(7) ANTENNAE.—Ice and snow must be removed for proper operation of communication equipment.

c. STARTING ENGINES AND WARM-UP.

- (1) PRIMING.—Prime each engine for two seconds before energizing the starter, then do not prime again until engine is turning over.
- (2) THROTTLE.—The throttle should be about 1/4 open.
- (3) CARBURETOR HEAT.—Use carburetor heat immediately after starting engine.
- (4) AUTOMATIC PILOT.—Check cold-weather operation of automatic pilot hydraulic system.
- (5) COWL FLAPS.—Keep open during warmup.
- d. TAKE-OFF.—Adjust cowl flaps to get 140-150° C cylinder head temperature.
- e. FLIGHT.—Keep cross-checking instruments.
 Cold temperature aggravates instrument lag.

f. PROCEDURE AFTER FLIGHT.

- (1) OIL DILUTION.—During cold weather to make the next start easier and reduce starting wear, the engine oil will be diluted in accordance with the following procedure:
- (a) Stop engine, and cool until engine oil temperature falls below 40°C.
- (b) Start engines and operate at 1000 to 1200 RPM.
 - (c) Dilute each engine separately.
- (d) Maintain oil temperature below 50°C, and oil pressure above 15 psi.
- (e) Hold dilution switch "ON" (17 and 46, figure 7) for a length of time indicated after temperature expected.

4° to -12°C (40° to 10°F)
3 minutes
-12° to -29°C (10° to -20°F)
5 minutes
-29° to -46°C (-20° to -51°F)
8 minutes
Add 1 minute dilution for each additional
5°C (9°F) below -46°C (-50°F).

Note

If oil temperature tends to exceed 50°C during dilution, stop engine and permit temperature to cool well below 40°C. Then restart and continue dilution procedure. The total of the two or more dilution periods should equal the time mentioned in (e) immediately preceding. If oil tank must be serviced, split the dilution time in two periods and service the oil tank at the end of the first period. Again the total time of two dilution periods



Figure 26—Heating System Controls

should equal the time mentioned in the preceding chart. Any deviation from these dilution periods found more satisfactory by experience may be used.

(f) On all airplanes equipped with Hamilton Standard Propellers operate for the last 2 minutes of the dilution period as follows:

Propeller feathering switch—Permit 400 RPM drop, then return to normal. Repeat three times.

- (g) Stop engine in normal manner, holding the oil dilution switch "ON" until engines stop.
- (b) If 50 hours engine time has elapsed since the last oil dilution was accomplished two or more dilutions will be used instead of one. On these occasions, the engine will be given the full dilution period and after each dilution, the engine will be shut down and the oil pressure screens will be removed and cleaned. This is necessary because the fuel in the oil tends to wash down any accumulated sludge within the engine. After reinstallation of the oil screens, the engine will be started and run for at least 20 minutes at 1000 to 1200 RPM to evaporate any fuel in the oil. The engine will then again be diluted for the usual period of time.

- (i) The term "over-dilution" has been used to indicate any amount of dilution which causes the engine scavenging system to break down and discharge oil through the engine breathers. This condition is serious as it may be possible to lose completely all engine oil in a short period of time due to the breakdown in the scavenging system. Usually the oil discharge will occur on take-off or when high RPM are used immediately after a heavy dilution. High percentages of dilution have no serious effect on engine bearings if the oil pressures remain normal. If oil discharge occurs under cold conditions, it may best be stopped by reducing power and RPM immediately.
- (2) BRAKES.—Leave brakes "OFF" when the airplane is parked, to prevent locking by ice.

g. USE OF PORTABLE GROUND HEATERS.

- (1) Use two Stewart-Warner type D-1 ground heating units, AAF Specification No. 40390, or equivalent if available, to heat the airplane and engines while moored, or before the first flight of the day. Put engine covers on before applying heat.
- (2) Hand-operated portable ground heaters, if available, may be used for preheating the engine sections, melting snow and ice from control hinges and cables and at other points where spot-heating is required.
- (3) ATTACHING GROUND HEAT CONNECTIONS. (See figure 25.)—A "Y" connection is provided to be inserted in the air duct of the airplane's nose cone, to accommodate two hose adapters, one from each ground heater unit. Before attaching ground heat adapters, use a ladder or other means of elevation and reach into the mouth of the nose cone air duct to open the battery heat valve and the pilots' compartment heat valve. These valves must be opened before the ground heat connection is installed, since they have no remote control.
- (a) In the pilots' compartment, place the cold air valve control in the "DOWN" (closed) position. Then push in the control knobs to open the foot warmer and defroster valves located on either side of the lower pedestal. Ensure that the pilots' compartment door is closed after adjusting all controls.
- (b) Attach the center duct of each ground heater to the ground heat connection in the airplane nose.
- (c) Open the ground heat access door in each bottom engine cowl and attach a ground heater door tube to the opening, through the sleeve in the engine cover.

CAUTION

Do not permit excessively hot air to blast against ignition harness, flexible hose or other rubberized or fabric materials. The blast will be too hot unless the hand can be comfortably held for one minute in the same position as the part in question.

(d) If the airplane is equipped with Hamilton propellers, attach a heater duct to the adapter in each propeller dome cover.

CAUTION

After heat has been applied and the ground heat connection removed from the nose section, be sure that the battery heat valve and pilots' compartment heat valve are closed by reaching into the nose duct. These valves cannot be closed when the airplane is in flight, since they have no remote controls.

- b. EMERGENCY COLD-WEATHER OPERA-TION.—When containers and heating facilities are not available for draining and warming oil, the following procedure may sometimes be successfully used if the minimum temperature does not fall below -30°C (-22°F).
- (1) Use normal oil dilution procedure before shutting down engines.
- (2) After shut-down, drain sufficient oil from the system to bring oil level to two-thirds of its total capacity.
- (3) Restart engines and run with covers over oil coolers if necessary, until oil temperature shows 50° to 60°C.
- (4) With engines still running at 800 to 1000 RPM, slowly add enough fuel at the oil filler neck to fill the system. This gives a two to one ratio of oil to fuel and will produce some dilution of the oil adjacent to the tank hopper.
- (5) Restart after 20 to 30 minutes and give a second dilution, using only the normal dilution procedure, followed by a final shutdown.

CAUTION

The foregoing is strictly an emergency procedure to be followed only when equipment is lacking for heating or draining oil. When the fuel evaporates, only two-thirds of the total oil capacity remains in the system and it must be sufficient for flight to a new oil supply.

2. DESERT OPERATION.

- a. DESERT EQUIPMENT.
- (1) PROTECTION AGAINST DUST AND SAND.—Boots and covers have been furnished to protect all exposed portions of the airplane; for example, in the landing gear and tail wheel wells, where the infiltration of dust may hinder operation of the airplane.

- (2) PLUGS AND COVERS.—Following is a list of plugs and covers which are installed at all times when the airplane is to remain on the ground for an extended period of time in dusty or sandy areas. All plugs are equipped with pull cords for easy removal prior to starting engines.
 - (a) Nose cone air intake plug.
 - (b) Battery drain plug.
 - (c) Pitot tube boot assembly.
 - (d) Hydraulic drain plug.
 - (e) Nacelle carburetor air scoop plug.
 - (f) Heater carburetor inlet plug.
 - (g) Exhaust pipe and breather plug.
 - (b) De-icer and oil separator exhaust plug.
 - (i) Fuselage louvers cover.
 - (j) Center wing panel heater exhaust cover.
 - (k) Outer wing panel fuel vent plugs.
 - (1) Landing gear well covers.
 - (m) Landing gear brake covers.
 - (n) Long-range fuel tank vent plug.

CAUTION

All dust plugs and covers must be removed before starting the engines.

b. STOWAGE OF EQUIPMENT.

The desert equipment should be stowed in the dust equipment stowage bag when not installed on the airplane. The stowage bag is secured to the cargo rings (four places) in the forward cargo compartment between station 128 and station 150.75, on the right side.

c. CARBURETOR AIR FILTERS.

- (1) Filters are installed in the air induction ducts leading from the nacelles, to rid the air of sand and other foreign materials.
- (2) The filters are operated by a control (16, figure 3) located at the base of the control pedestal.
- (3) Place carburetor heat control (11, figure 3) in full "HOT" position before pulling filter control. Pulling on the air filter control actuates a butterfly valve just above the carburetor, which closes each top cowl air scoop and opens the air induction ducts from the nacelles to the carburetor air intake.
- (4) Lock the air filter control in the slot provided.
- (5) The pilot should personally check to see that during desert operation the air filter control cables are connected to the filter control.

的研究,对自己的问题,但是一种自己的一种的一种的一种 \$P\$\$P\$1. 15时,我们就是否的相互工作。1. 120分离的人类的自己的 STATE HAS SEEN FOR THE SHEET SHEET AND ASSESSED TO SEE SHEET \$100 (100) \$1000 \$1000 \$1000 \$1000 \$100 \$1000 \$100 \$1000 \$100 \$10 AND THE PROPERTY OF STREET AND ADDRESS OF THE PARTY OF TH the comment of the second seco 所 特別性之 原体 BEC BELL THE AS NOW SEER FOR STORY ASSESSED. Townson the test the four tests and the same tests CHARLES THE PRINTED SHE Control of the second of the second of the second of the second AND THE PERSON NAMED TO BE SEEN THE PERSON NAMED TO BE SEEN TO BE bling march arrespect CANADA AND THE PARTY OF THE PROPERTY OF THE PARTY OF THE The few wine bearing authorizing the bearing and the second and the second second And a series of the series of during species size to the state of the The body of the part of the pa 加州 中国上海市中国的 西州州中国市 Linear Print, householder of the second reduction appropriate of systems. assets with man I have come and the The second of th The last to be a second to the 大学士 上海 的成 database 1 753 THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF PRINCIPLE OF THE SELECT OF THE in the Personal Property of the Company of the party of the company of the compan Market weeks Just | Special Special Street, Special Sp the driver constraint and the second beautiful about the house The time and and the Committee of the second commit THE RESERVE AND THE PARTY OF TH I THEN SOME AND A SERVICE COMPANY OF THE PARTY SHOWS AND ADDRESS OF THE PARTY. THE RESIDENCE OF BUILDING CONTRACT TO SEE THE SECOND CONTRACT TO SECON · indials the wholes with the same through the color than AND SECURE AND AND SECURE AND SEC The parties of the latter before the Applicable only september to a september to Statement Comment Comment of the second contract of the

L		AIR	AIRCRAFT	MODEL	(8)																	ENG	ENGINE MO	MODEL (S)		
		911-7		^					2	KE-OFF,	JEF,		4	3	ANDING	E	ART					R-2	R-2800-51 ((2SBG)		
DMRAA 1-1		-								-	AKE	-OFF	5	STAI	NCE	FEET							-75 ((2886)		
1		L				HARD	SURFACE	CE RUNW	NWAY					-00S	TURF R	RUNWAY					SOF	T SURFACE				
	GROSS	= 3	HEAD	AT S	SEA LEVEL	EL	AT 3000	L		9009	FEET	AT SEA	LEVEL	TA	3000	FEET	AT 60	6000 FEET		AT SEA	LEVEL	AT 3(3000 FEET	TA AT	000	
	LB.	9 2	H. KTS.	1 = =	5 %	0 CLEAR 50' 08J.			œ .	GROUND TO RUN 50	O CLEAR 50' 08J.	GROUND	TO CLEAR 50' 08J.	œ .	GROUND TO RUN 50	0 CLEAR 50' 08J.	GROUND	TO CLEAR 50' 08J.	_	GROUND	TO CLEAR 50' 08J.	GROUND	TO CLEAR 50'08J.	RUN RUN	TO CLEAR 50'08J.	S S
	40,000			1350		1950	1600	2300 1550 900		000	2750 1850 1150	1450 850 450	2050 1350 750		1700 2 1050 1	2400 1600 950	2050 1300 700	2900 1950 1200	000	1650	2250 1500 850	2000	2700 1800 1050	2500 1650 950	3350 2300 1450	
	45,000	083	35 7 0	1750	- 2	500 650 950	2050 1300 750	2850 1950 1200	25	2450 1600 950	3450 2400 1500	1850 1200 650	260 0 1750 1050		2250 3 1400 2 800 1	3050 2050 1250	2700 1750 1050	3700 2550 1600	000	2150 1400 800	2900 1950 1200	2700 1800 1050	3500 2450 1500	3450 2350 1450	4450 3150 2000	I TEET
	50,000	283	35	2200 1400 800	3000 2050 1250	2000	2600	3500 2450 1550		100	425 C 3000 1950	2400 1550 900	32 00 2200 1350		2900 3 1950 2 1150 1	3800 2700 1700	3600 2450 1500		999	3000 1950 1200	3800 2600 1650	3800 2550 1550	330(210)		6000 4250 2900	
NOTE	0		- W	S AS FOLLOW	LOWS	1:75*F + 10%; 100*F	+	20\$; 125°F NOTE	+ 30£;	150*F+ 4	TAKE-OFF	F POWER	UNTIL	CLIMB	AIRSPEED	1.5	REACHED.	TAK	E-OFF WITH	SELOW.	. 52 IN.	HG. 8	DEG.FLAP IS	10 \$08	-	
ON	2	2		BASED ON				0.1				CLIM	9	ATA				Ties of							,	7770
1			AT SEA	LEVEL	-		AT 5000	FEET		-	AT 10,0	10			AT 15,000	DO FEET		AT	20,	000 F	FEET	AT		EE		
	GROSS	BEST	. k. S.		GAL. BI	-		FROM	SEA LEVEL	BEST I.	RATE OF	FROM	FUEL FUEL	BEST I.A.	00 1 00	FROM SE	5	BEST 1.	A. S. R.	FROM	SEA	MPH K	KTS CLING	Z E	CHAN	ociul McD
	LB.	Ē	STS C	. z	13		KTS CLIMB		USED	Ē	F. P. M.	-		-	F. P. M					F. P. M.	. USED	-	F. P. M.	z z	usen	
	40,000	107	93	066	09	107 9	93 1020	0.5.0	85	107	93 810	0 10.5	120	107	93 690		160	107							0016	0
	45,000	=		785				9	95	. 1		2 1		1000	99 495	22	185	114	99 2	260 35.7	.7 255				0016	
200	50,000	120 101	10t	620	60 L	2		7.9	0	021	£ 6		DOI TO IN IN IN	-	100 to	63		2	_					1000	-	
DAT	A AS OF	45		BASED	ON: FLIG	도	TEST 2400	KFM,	47.0	. 10.		DIA !			1				FUEL U	USED (U.	S. GAL.)	INCLUDES	WARM-UP	A TAKE-UFF	ALLOWANCE	
										_	NA	Z	DIS	4	NCE	FEET				-						-
		-	BEST IA	AS APPR	APPROACH			HARD	DRY S	SURFACE					FIR	RM DRY	SOD					WET (OR SLIP	I PPERY		
	GROSS	2	POWER OFF	FF POWER	ER ON	AT SE	A LE	VEL AT	3000	FEET	AT 6000	O FEET	AT SE	EA LEVEL	L AT	3000 F	T33:	AT 6000	O FEET	AT AT	SEA LEVEL		3000 FEET	AT	00	-
	LB.	I	HPH KTS	S MPH	KTS	GROUND	TO CLEAR 50'08J.	EAK GROUND BJ. ROLL	-	CLEAR	GROUND	TO CLEAR 50' 08J.	9	10	5	5,0	0 CLEAR 50'08J.	GROUND	TO CLEAR 50'0BJ.	9	5 2	_	0 20	· ×	5 2	BJ.
	35,000	1 60 60	78 68 84 71	8-1		1100	2450 2450 2650		1400	2400 2600 2800	1350	2550 2800 3050	1200 1400 1600		2400 2600 12800		2550 2800 3050	1800	3000	3800	200 200 200 200 200 200 200 200 200 200	- 0	-	5300 HH 00 5300 HH 00 5800 5000	00 5600 00 6200 00 6200	300
RE	REMARKS:			BASED ON:		FI IGHT IS	EST							ISE		WING FLA	S						1	= =	AIRSPEED	
ON N	SH	DETERMINE F	FUEL	CON SU	FUEL CONSUMPTION																		M.P.H.	MILES PER		
3	TIPLY BY	O. THEN	N DIV	105 8	Y 12																					

Figure 27-Take-off, Climb and Landing Chart

igure 28 (Sheet 1 of 8 Sheets)-Flight Operation Instruction Chart

EXTERNAL	OF ENGINES	UMN I IS FOR EMERGENCY MIGH SPEED CRUISI AND V GIVE PROGRESSIVE INCREASE IN RANGE AIR MILES PER GALLON (MI./GAL.) (NO WIND)	TRUE AIRSPEED (T.A.S.)	(OR G. P. H.) BY 10 THEN DIVIDE	FUEL	U.S.	GAL.		1300	1200	0000	800	600	300) PRESS		35000 35000 30000	25000 9 20000 8 15000	1 10000 2 5000 3.L.		: PRESSURE ALTITUDE : MANIFOLD PRESSURE : U.S.GAL.PER HOUR : TRUE AIRSPEED : KNOTS : SEA LEVEL	SUBJECT TO
	NUMBER	NOTES: COLUMN 11,111,1V AND IN SPEED. AIR	P.H.) A	U. S. GAL (OR G	11	IRMILES	NAUTICAL		1370	1180	980	785	200	390 295 195		TOT. T.A.S.		190 217 189	190 212 184 175 198 172 160 184 160		M.P. GPH TAS KTS. S.L.	ELIMINARY. DATA,
CHART	POUNDS	FUEL COLUMN FOR CRUISING	MILE	PRESSURE	COLUMN	RANGE IN A	TATUTE	SING (1)	080	355	30	905	380	450 340 225	STAT. (. 98 NAUT	M.P. MIX- INCHES TURE		F.T. A.R. F.T. A.R.	32.0 A.L. 32.0 A.L. 32.0 A.L.		UEL) DE RE	ARE PR
INSTRUCTION	TO 40,000	GURE IN BE USED	UTICAL	, MANIFOLD			AL S	FOR CRU			.==	0,7	. • • •	300-	(GAL.) (1.13	.A.S. R.P.M.		197 2350	195 2100 185 2100 175 2100		AT \$3000 LB.GROSS WEIGHT WITH 1300 GAL.OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 100 GAL.) TO FLY 1250STAT.AIRMILES AT 5000 FT.ALTITUDE MAINTAIN 2100 RPM AND 32.0IN.MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-LEAM. LOW BLOWER	RED FIGURES
the state of the s	000	SELECT OF FUEL	TATUTE AND OF	ALT.) READ RPM REQUIRED.	III NMI	N AIRMILES	NAUTICAL	NOT AV	1060	086	815	650	415	325	INAUT. MI.	TURE TOT. T.A		R. 240 227 R. 250 232	.R. 235 224 .R. 225 213 .R. 215 201	EXAMPLE	O LB.GROSS WEIGHT WITH 13 EDUCTING TOTAL ALLOWANCES 1250STAT.AIRMILES AT 500 12100 RPM AND32.0IN.MAN TURE SET: AUTO-LEAN. I	
OPERATION	LIMITS: 45	S THAN AMOUNT	TER TH	ALTITUDE (COLUMN	RANGE	STATUTE	A.	1315	1130	940	750	565	375 280 185	. 9 . STAT. (. 8	P.M. INCHES TO		2350 F.T. A.	950 F.T. A. 800 F.T. A.		AT #3000 LB.GRO (AFTER DEDUCTING TO FLY 1250STA MAINTAIN 2100 R WITH MIXTURE SET	
FLIGHT OP	CHART WEIGHT	EQUAL TO OR LESS	AL TO OR G	(M. P.) AND MIXTURE		AIRMILES	NAUTICAL	SUBTRACT FUEL	910	780	650	520	325	260 195 130	1	TOT. T.A.S. R.I		310 241 210 <u>22</u> 320 237 206 <u>23</u>	310 236 205 21 300 225 196 19 290 211 183 18			
		G.P.H. G.P.H.	PLANT	575 FOR 0 POWER (FIG.	COLUMN	RANGE IN A!	STATUTE		975	006	750	600	450	300 225 150		M. P. MIX- INCHES TURE		F.T. A.R. F.T. A.R.	F.T. A.R. 39.0 A.R. 40.0 A.R.		& CLIMB (SEE FIG. 27) COMBAT AS REQUIRED. LINE ONLY	TEST
L (S)	SBG)	TIME CYL. LIMIT TEMP.		5 260	FUEL	U.S.	GAL.		300	200	0000	800	600	300	PRESS (.75	ALT. R.P.H.	35000	25000 20000 20000 15000 2100	10000 2300 5000 2150 S.L. 2150	L NOTES	• 0	FLIGHT
MODEL	-51(2SBG) -75(2SBG)	POSITION		AR	<u>E</u>										1	S. KTS. F	3 8 4	20 20 20 216 15	210 10 204 E	SPECIAL	FOR WARM-UP, TAKE FOR WIND, RESERVE OWER ABOVE HE	ASED ON:
AIRCRAFT C-46	~	IN. HG. POSITION P		1 LOW 7 HIGH	- N	AIRMILES	NAUTICAL		775	665	555	445	335	220 165 115	CONTINUOUS	TOT. T.A.		415 249 2	355 241 2 380 233 2 350 221		ALLOWANCE ALLOWANCE HIGH BL	/45 8
1	ENGINE (S)	R.P.W.		TARY 2700 51	COLUMN	RANGE IN	STAUTE		830	765	540	510	385	190	HUM	M. P. MIX- INCHES TURE		F.T. A.R.	F.T. A.R. 42.0 A.R. 42.0 A.R.		(1) MAKE PLUS (2) USE	AS OF 3/8
	ш	T 8		ER R			_	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN			-	1				100		-				1000

[S	H	ш										T		T	1	.S.		69	58 43 29		
			ONLY.COLUMNS	PER	G ALONE		ES	ICAL		06	35	800	25	65	0 0 0	385	30		T.A.S		198 16	14.9		CHECK
	NONE		ONI	SALLO	FLYING	>	RMIL	NAUTICAL		17	- 5	-2-	- 0	0 1	0 40	000		RANGE	TOT.		30	000	RICH RICH LEAN ING LEAN L LEAN THROTTLE	FLIGHT
		3: 2	CRUISIN) (NO WIND), APPROXIMATE	AIRPLANE	COLUMN	A			10					+		- 1	A . R	MIX-				FULL RICH AUTO-RICH AUTO-LEAN CRUISING MANUAL LE FULL THRO	
	ITEMS	ATIN	SPEED	./GAL) (NO	AVERAGE A II AL GAL (OR IDE BY 12.	00	GE 1	TE		00	50	200	500	20	20	20		MOM			44	-00		AFTER
	LOAD	OPERATING:	Y HIGH SPE	(MI./GAL.S.) ARE	IMPERIAL EN DIVIDE	18	RAN	STATUTE		206	176	147	117	88	73	440	=	MAX	INCHES			30 30	N N	REVISION
	-		R EMERGENCY	ALLON	ARE FOR AN ITISH IMPERI														R. P. M.		2100	1700 1650 1600	ES	TO RE
	EXTERNA	ENGINES	IS FOR EMERGENCY HIGH SPEED CRUISING	S P A IR	N BRI	FUEL	U.S.	GAL.		1300	1200	0006	800	9009	200	300	100	PRESS	ALT. FEET	40000 35000 30000	25000 20000 15000	10000 5000 S.L.	PRESSURE ALTI MANIFOLD PRES U.S.GAL.PER H TRUE AIRSPEED KNOTS SEA LEVEL	
		R OF	COLUMN I	AIR MILE	(NO WIND). TO OBTAI U.S. GAL (OR G. P.H.)								1				1	AL.)	.S.	17.1	197	185	M.P.: P M.P.: M GPH : U TAS : T KTS.: K	DATA, SUBJECT
		NUMBER		(G. P. H.) A	WIND)		LES	TICAL		385	280	096	850	049	535	320	105	MI./6	T.A		227	213 200 186	A A D L A S	2015
			NOTES:	IN SPE	(NO U.S.	2	AIRMI	NAUT				-	-				-	(n.)	TOT.		180	175		IMINARY.
	E	SC	LUMN	LES	R E	COLUMN	=						3		+		1	JONA	MIX-		A.R.	A.L. A.L.	1 2	PREL
	CHARI	POUNDS	0 0	E VALIE	ARESSU	0	RANGE	STATUTE	ING (I)	590	470	225	980	735	615	370	125	TAT. (M. P.		F.T.	22.5	OF FUE GAL.) LTITUDE PRESSUR	ES ARE
		000	3,	RANG	FOLD P	18		ST	CRUIS				1				-	1.238	R. P. K.		350	0000 3	100 L	FIGURES
	10	35,0	RE IN	LECT AUTIC	E VAL				FOR						1		+	L.) (1	1 8		204 23	92 26	1310 ES OF 000 F W BLO	RED
	INSTRUCTION	10	0.0	ND SE	RPM.		ES	ICAL	LABLE	65	85	000	20	40	50	270	90	. / GA	T.A.S.		35	97	NATE NO NATE NA NATE NATE	
	STE	0	ELECT	EFT A	READ RED.	=	KMIL	NAUT	AVAIL	- 12	00	തെ	1 9	0 10	3 4	- 20		~~	TOT.		220 2	000	EXAMPLE EIGHT WI AL ALLOW RMILES A D 32.5 I TO-LEAM,	
		40,000	RT:	OR L HE ST	ALT.)	NA	N N		S NOT			1			1		\neg	90 NAUT	URE 1		2.2		SS WE TOTA A A B B A A B B	
	OPERATION	TS: 4	G CHA	RIGHT HAN T	TUDE (COLUMN	NGE	TUTE	OWANCES	55	112	300	30	50	20	00	2	r. (.9			44	444	STAT STAT S S E F	
	RA	Σ	USIN	Y TO	ALTI E SET		RA	STATU	ALLO	13	12	06	81	9	20	5.3		O4STA	M. P.		л г г	000	1800 LB.	
	OPE	GHT L	S FOR	ONTALL R GREA	ISING				FUEL				4		-		- 1	=	9.	1	2250	205 185 175	AT 38 (AFTER 10 FL)	
	GHT	WE I	-	08120 TO 08	FLOWN D CRU			AL	TRACT									GAL.)	A.S.		214	8 - 50	4011	
	FLIG	CHART	INSTRU	MOVE H EQUAL	TO BE DESIRE (M. P.)	-	ILES	NAUTICA	SUBT	1035	885	740	590	445	370	220	75	MI.	T.A		246	231		
	-	5		n X m	- 00	-	AIRM	N/										NAUT.)	TOT.		290	275 250 235	E.	
			3; 194; (11	AILS SELLI	FOR DETA	COLUMN	=											74 M	MIX-		A A B	A A A . R . R . R . R . R . R . R . R .	(SEE FIG. 27) AS REQUIRED. OHLY	
			TAL P.H.	575			RANGE	STATUTE		190	020	850	680	200	340	255	85	STAT. (M. P.		<u> </u>	F.T. 30.0	m *	TEST
			CYL. TO		260	1		ST			Ī						- 1	.858	R. P. M.		2350	950	ES CLIMB ID COMBAT J	I GHT T
	(8)	258G 258G	TIME		20	FUEL	u.s.	GAL.		000	000	000	000	000	000	300	8	PRESS (\$5000 30000	20000 2	10000 5000 8. L.	SPECIAL NOTES ALLOWANCE FOR WARM-UP, TAKE-OFF & ALLOWANCE FOR WIND, RESERVE AND C HIGH BLOWER ABOVE HEAVY	FLIG
	SERIES	-51(MIXTURE		۳.	E	-	6		3 =	12	- 00	81	9	2 1	00	-	- A	116	35			WARM-UP, TAKE- WIND, RESERVE ER ABOVE HI	
	- s	00		1	4	1	S	CAL						*					T.A.S.		49 216 52 219	3 211 8 207 2 193	SP K K K	BASED
	IRCRAF C-46	3-2800	BLOWER		LOW		MILE	NAUTICAL		735	630	525	420	320	260	160	55	SUOUN	T. T.		00	5 24 0 23	ALLOWANCE ALLOWANCE HIGH BI	_
	4	(S): R	M.P.		51	NWS	AIR											CONTINUOU	re TOT.		3.0	35 38	MAKE AL PLUS AL USE H	/8/45
		ENGINE (R.P.M.		100	COLUMN	GE IN	E										MOM	S TURE		××.	00. A A A	3 3	0F 3/
		ENG	TS	% e.	N		RANG	STAUTE		845	725	605	485	360	300	180	9	MAX	M. P.		-:-	F.T 42.		AS
	-1-## -1-##		LIMI	WAR	MILITARY														R. P. M.		2400	2400 2400 2400		DATA
-						11				1	0.75	7.5	_		_		_				44	444		

Figure 28 (Sheet 3 of 8 Sheets)-Flight Operation Instruction Chart

SNONE	3: 2	FED CRUISING ONLY.COLUMNS SE IN RANGE AT A SACRIFICE) (NO WIND), GALLONS PER HR. APPROXIMATE VALUES FOR NGE AIRPLANE FLYING ALONE NL (OR G. P.H.): MULTIPLY Y 12.	COLUMN V	N AIRMILES	NAUTICAL		975 835 695	560 420 280 140	AIR RANGE	TURE TOT. T.A.S.		. 125 199	. 120 194	A.L. 105 163 142 A.L. 85 140 122		ER FLIGHT CHECK
AL LOAD ITEMS	ES OPERATING:	RGENCY HIGH SPEED ESSIVE INCREASE IN LLON (MI./GAL.) (NG (T.A.S.) ARE APPR E FOR AN AVERAGE A SH IMPERIAL GAL (CTHEN DIVIDE BY 12	100	RANGE IN	STATUTE		1120 960 800	640 480 320 160	MAXIMUM	R.P.M. INCHES TI		F.T.	F.T.	1600 28.0 A	E F.R. : A.L. : C.L. : M.L. : F.T. :	TO REVISION AFTER
EXTERNAL	ENGINES	I IS FOR EMEN V GIVE PROGRE MILES PER GAI RUE AIRSPEED GE VALUES ARE OBTAIN BRITIS	FUEL	U.S.	GAL.		700 600 500	400 300 200 100	PRESS	ALT. FEET	\$5000 30000	25000	12000	10000 5000 S. L.	0 0 -	_
	NUMBER OF	II, III, IV AND V GIVE IN SPEED. AIR MILES (G.P.H.) AND TRUE AI REFERENCE. RANGE VAI (NO WIND). TO OBTAIN U.S. GAL. (OR G.P.H.)	>	AIRMILES	NAUTICAL		860 740 615	490 370 245 125	AUT.) MI./GAL.)	TOT. T.A.S.		227	215 18	. 135 190 165 . 125 175 152	M. P. : GPH : TAS : KTS. :	ELIMINARY DATA, SUBJECT
ON CHART	30,000 POUNDS	E IN FUEL COLUMN USED FOR CRUISING ECT RANGE VALUE UTICAL AIR MILES VALUE NEAREST ANIFOLD PRESSURE	MNTOO	RANGE IN	STATUTE	R CRUISING (1)	990 850 705	565 -425 285 140	(1.41 STAT. (1.23 M	R.P.M. MIX-		F.T. A.L	F.T. A.L	1850 F.T. A.L. 1800 32.5 A.L. 1700 33.0 A.L.	AL.OF FUEL 15 GAL.) ALTITUDE PRESSURE BLOWER	RED FIGURES ARE PRE
INSTRUCTION	0	SELECT FIGUR OF FUEL TO BE LEFT AND SEL STATUTE OR NA (AND OPPOSITE () READ RPM, M	N	AIRMILES	NAUTICAL	NOT AVAILABLE FOR	690 590 495	395 295 195 100	NAUT.) MI./GAL.)	TOT. T.A.S. GPH. MPH. KTS.		200 237	205 230	. 185 218 190 . 180 206 179 . 170 194 169	EXAMPLE NEIGHT WITH 415 TAL ALLOWANCES OF VIRMILES AT 5000 AND 27.5IN.MANIF	RE
OPERATION	IT LIMITS: 35,000	R USING CHA S THAN AMOU LY TO RIGHT ATER THAN T RTICALLY BE G ALTITUDE (COLUMN	RANGE IN	STATUTE	FUEL ALLOWANCES	790 680 565	455 340 225 115	(1.13 STAT. (.99)	R. P. M. P. MIX-		F.T.	ET.	2000 F.T. A.R. 1800 F.T. A.R. 1700 F.T. A.R.	AT 3 2000 LB. GROSS (AFTER DEDUCTING TO TO FLY 600 STAT.A MAINTAIN 1600 RPM WITH MIXTURE SET:	
FLIGHT 0	CHART WEIGHT	EQUAL TO OR LES MOVE HORIZONTAL EQUAL TO OR GRE TO BE FLOWN. VE DESIRED CRUISIN (M.P.) AND MIXTU	1	AIRMILES	NAUTICAL	SUBTRACT	515 445 370	295 220 150 75	NAUT.) MI./GAL.)	TOT. T.A.S. GPH. MPH. KTS.		290 249	270 242	275 234 203 R. 260 223 194 R. 245 210 183		
	-	Z 60 STS DETAILS SEE	1	RANGE IN	STATUTE		595 510 425	340 255 170 85	(.85 STAT. (.74)	R.P. MIK-	•	2350 F.T. A.R.	F.T.	2000 F.T. A.R. 2000 40.0 A.R.	CLIMB (SEE FOMBAT AS REQU	FLIGHT TEST
EL (S)	-51 (2SBG) -75 (2SBG)	TIME LIMIT	FUEL	U.S.	GAL.		700	2000	PRESS	ALT. FEET	35000	25000	15000	10000 5000 S.L.	WARM-UP, TAKE-WIND, RESERVE	ON: FLI
AIRCRAFT MODEL	. R-2800	M.P. BLOWER MIXTURE IN.HG. POSITION POSITION 51 LOW A.R. 47 HIGH A.R.	- 4	AIRMILES	NAUTICAL		375 320 265	2 5 60 05 55	CONTINUOUS	TOT. T.A.S. G.P.H. KTS.		310 252 219	415 254 221	1. 355 246 214 1. 380 241 210 1. 350 225 196		-8-45 BASED 0
nn-1-	ENGINE (S)	WAR EMERG.	COLUMN	RANGE IN	STAUTE		430 370 305	245 185 125 60	HAXIMUM CO	P. M. P. MIX-		2400 F.T. A.R.	00 F.T. A.R.	2400 F.T. A.R. 2400 42.0 A.R. 2400 42.0 A.R.	(3)	ATA AS OF 3-
MC-528	AAF	7 - 2 3 2		1	1					2		24	2400	24 42		٥

FEATHERED OPERATING: ONE	B - 8 4	OR G. P. H.): MULTI	COLUMN V	GE IN AIRMILES	TE NAUTICAL						MAXIMUM AIR RANGE	E P				F.R. : FULL RICH A.R. : AUTO-RICH A.L. : AUTO-LEAN C.L. : CRUISING LEAN M.L. : MANUAL LEAN F.T. : FULL THROTTLE
LERNAL LI	1 01 - W 3	AIN BRITISH IMPER	FUEL	U.S. RANGE	GAL. STATUTE						DDECC MA)	ALT. R.P.M. INCHES	30000 30000	25000 20000 15000	10000 5000 S. L.	ALT.: PRESSURE ALTITUDE F.E M.P.: MANIFOLD PRESSURE A.E GPH: U.S.GAL.PER HOUR A.I TAS: TRUE AIRSPEED C.I KTS.: KNOTS S.L.: SEA LEVEL F.T
I PROF	NOTES: COLUMN 11,111,1V AND 1N SPEED. AIR (G. P.H.) AND	(NO WIND) TO OBT U.S. GAL. (OR G.P.H	UMN IV	IN AIRMILES	NAUTICAL						NAUT.) MI./GAL.)	A P P R				
RATION CHART	USED FOR	ANIFOLD PRESSURE	MNTOO	RANGE	STATUTE	FOR CRUISING (1)) (STAT. (R.P.M. INCHES				AKE -
NE OPE	T: SELECT T OF FUEL OR LEFT A E STATUTE	R P M .	III NWI	IN AIRMILES	NAUTICAL	NOT AVAILABLE					NAUT.) MI./GAL.	TURE TOT. T.A.S. GPH. KTS				EXAMPLE S WEIGHT WITH AIRMILES AT 50 M AND 42.0 IN. MA AUTO - RICH, IPT SINGLE
OPERATION IGLE ENGI	FOR USING CH LESS THAN AMO TALLY TO RIGH GREATER THAN	ISING ALTITUDE (COLUMN	RANGE	STATUTE	FUEL ALLOWANCES					(STAT. (R.P.M. INCHES TURE				AT 50000 LB.GROSS TO FLY 500 STAT MAINTAIN 2400 RPI WITH MIXTURE SET: DO NOT ATTEN
FLIGHT OP SINGL CHART WEIGHT	EQUAL TO OR MOVE HORIZON EQUAL TO OR	P.) AND	HN 11	AIRMILES	NAUTICAL	SUBTRACT				, ,	AUT.)					27) 0.
	TEMP. G. P.H. TEMP. G. P.H. TEMP. G. P.H. TAILS SEE TAILS SEE	260 280 PER POWER (FIG.	COLUMN	RANGE IN	STATUTE						(STAT. (N	R. P. M. P. MIX-				OFF & CLIMB (SEE FIG. 27) AND COMBAT AS REQUIRED.
7 22	TIME	2	FUEL	u.s.	GAL.	1400	1200	0006	800 700 500	300 200 100	PRESS		\$5000 30000	25000 20000 15000	10000 5000 S. L.	UP, TAKE-
A I R C R A F C C - 46 S R - 280	4.P. BLOWER MIXTURE	51.0 LOW AR 47.0 HIGH AR	UMN I	AIRMILES	NAUTICAL	890	760	635 570	510 445 380 315	255 190 125 65	CONTINUOUS	TOT. T.A.S. GPH. KTS.			190 138 123 175 134 119	NE ALLOWANCE US ALLOWANCE
ENGINE (S)	LIMITS RPM. IN WAR EMERG.	POWER 2700 51	COLUM	RANGE IN	STAUTE	1020	875 805	730	585 510 440 365	290 220 145 75	HOM	R.P.M. INCHES TURE			2400 42.0 AR 2400 42.0 AR	(1) MAKE PLUS

Figure 28 (Sheet 5 of 8 Sheets)-Flight Operation Instruction Chart

																			William .	
	ONLY. COLUMNS	GALLONS PER HR	ALONE PLY		S	AL		-000	101000	0.10.00		T.A.S.			7 = 12					CHECK
OH	ONLY.	ALLONS VALUES	G. P. H.): MULTIPLY		IRMILE	NAUTICAL	1150	985 900 820 740	655 575 490 410	330 245 165 80	9	APP			132			LEAN	TLE	
ERED		ND), GA	OR G. P. H.)	> =	AIR	-					R RAN		1.5		04-		FULL RICH	AUTO-LEAN CRUISING L	MANUAL LEAN	FLIGHT
	ED CRU	ILES PER GALLON (MI./GAL.) (NO WIND), UE AIRSPEED (T.A.S.) ARE APPROXIMATE	12 OR A I	COLUMN	=					×1	UM A	MIX-			AR		: FULL	: AUTO	: FULL	AFTER
1.1	HIGH SPEED	/GAL)	AN AVERAGE FRIAL GAL DIVIDE BY I		RANGE	STATUTE	1320	1130 1035 945 850	75£ 660 565 470	375 285 190 95	MAXIMUM	M. P.		i in	F. T.	9	A. R.	A.L. C.L.	F.T.	
	ENCY H	S PER GALLON (MI. AIRSPEED (T.A.S.)	SH IMPERIAL THEN DIVIDE		~	STA	2.5	-90,0				R. P. M.			2200	LEGEND	TUDE	SULP.		REVISION
EXTERNAL ELLER ENGINES	IS FOR EMERGENCY	R GALL	RITISH	-		<u>.</u>	00	0000	0000	0000		1000	000	000			E ALTITUDE D PRESSURE	AIRSPEED	T3	10
EXTE EL	IS FOR	LES PE	VALUES TAIN BR	FUEL	U.S.	GAL	1400	1200	800 700 500 500	3000	0000	ALT.	40000 35000 30000	25000 20000 15000	10000 5000 S. L.		PRESSURE ALTITUDE MANIFOLD PRESSURE	U.S.GAL. PER HOUR TRUE AIRSPEED	KNOTS SEA LEVEL	BJECT
EXT PROPEL	- >	AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES	(NO WIND). TO OBTAIN BRITISH IMPERIAL U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE								AL.)	A.S.			BUY				KTS. : K	DATA. SUBJECT
I PR	NOTES: COLUMN	(G. P. H.) AND	WIND)		LES	NAUTICAL			4		MI./G	T.A					ALT M.P	GPH	S. K	
	NOTE	(G = 1	(NO U.S	2	IRMILES	NAU					1	F. F.			7					LIMINARY
	a			COLUMN	N N			02			NAUT	MIX- TURE					*		FF	EA.
INSTRUCTION CHART SINE OPERATION OOO TO 40,000 POUNDS	E IN FUEL COLUMN	VALUE	EAREST	9	RANGE	UTE	3				-								TAKE-OFF	ARE
5 000	FUEL C	RANGE ALAIR	2		RA	STATUTE	CRUISING		The second		STAT.	M. P.	9 13				FUEL	UDE	R.	000
OPERATION TO 40,000 P	IN FU	T RA	E VALUE MANIFOLD						1	1	_	R. P. M.					GAL. OF FUEL	TO FLY 800 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2100 RPM AND F. T. IN. MANIFOLD PRESSURE	- ENGINE	RED FIGURES
CTI OF 40		N L W	HAN.			_	E FOR				AL.)	A.S. KTS.					006	OO FT	LOW E - E	
PRC OP 0	H .	AND S	R P S		LES	NAUTICAL	AVAILABLE				MI./GAL.)	T. A				PLE		S AT 50	SINGLE	
LS W	SELEC	LEFT	ALT.) READ REQUIRED.	=	AIRMILES	NA					NAUT.)					EXAMPLE	VE IGHT	INNILES AND F. T	PT S	
		0 ~ 0		COLUMN	N N		TON S				NAI	MIX- TURE					AT 45000 LB. GROSS WEIGHT WITH	STAT. AIRMILES AT 5000 RPM AND F. T. IN. MANIF	ATTEMPT	
FIS: 4		A P B	TUDE (00	RANGE	TE	ALLOWANCES				1.					1	00 LB.	800 N 2100	NOT A	
ERATIC SLE I	11	Y TO F	ALT ALT E SE		RA	STATUTE	ALLO				STAT.		16-5				T 4500	TO FLY 800	N HLIM	
SINGLE EN	S FOR	NTALL	UISING MIXTURE				FUEL		9		_	R. P. M.					4	- 1		
IGHT S	TRUCTIONS	HORIZONTALLY	CR				SUBTRACT				BAL.)	T.A.S.								
		ALA	1 R E P.)		LES	NAUTICAL	SUBT				MI./GAL.)	T.A.								
F CH	INS INS	MOV EQU	DES (M.	= z	AIRMI	NA					NAUT.)	T0T.					-			
	19AH (111	SECT.	FOR DET POWER P	COLUMN	N.				55		NA	MIX- TURE					(SEE FIG. 27 S REQUIRED.			
	-	35 S11V.	280 061	Ö	RANGE	STATUTE					T. (M. P.				1				
THE REAL PROPERTY.	P. G.P.H.				RA	STA					STAT.						& CLIMB COMBAT			TEST
(S) (2 SBG) (2 SBG) (2 SBG)	E CYL.		260								-	R. P. M.				NOTES	AND AND			FLIGHT
	E TIME		5	FUEL	U.S.	GAL.	1400	1200	800 700 600 500	300 200 100	PRESS	ALT.	40000 35000 30000	25000 20000 15000	10000 5000 \$. L.		WARM-UP, TAKE-OFF WIND, RESERVE AND			
SERIES 00-51 -75	MIXTURE		AR									1 16			139	SPECIAL				ED ON:
CRAFT M 46 SE R-2800	BLOWER P		HOH HIGH		ES	NAUTICAL	0.0	95 20 50	575 505 430 360	90	S	. 4			157 13		CE FOR			BASED
AIRCRAFT C-46 S R-280			-	_	AIRMILES	NAU	0.6	8779	nn 4 w	00-	CONTINUOUS	APPROX TOT. T. GPH. MPH.			190 15		ALLOWANCE			
(S)	M.P.		51.0	COLUMN							CONT						MAKE			3/8/45
ENGINE	R.P.M.		2700	100	GE 1N	m l					HOM				O AR		Ξ			0F 3/
ENG	13	6.			RANGE	STAUTE	1080	995 910 830 745	665 580 500 415	330 250 165 85	MAXI	M. P.			42.0					AS 0
#-1-## VAFMC-528	LIMI	WAR EMERG.	POWE									R. P. M.			2400					DATA
1 to 16			Circles.																	5 16

Figure 28 (Sheet 6 of 8 Sheets)—Flight Operation Instruction Chart

ED	CRUISING ONLY.COLUMNS I RANGE AT A SACRIFICE I WIND), GALLONS PER HR. OXIMATE VALUES FOR IIRPLANE FLYING ALONE IR G.P.H.): MULTIPLY	Tene) - Mori Inc.	4N V	AIRMILES	NAUTICAL	0671	1280	1065	855	535	425 320 215 105	R RAI	TOT. T.A.S.			105 126 112	FULL RICH AUTO-RICH AUTO-LEAN CRUISING LEAN MANUAL LEAN FULL THROTTLE	FLIGHT CHECK
R FEATHERE ES OPERATING: C	NO N	15	COLUMN	RANGE IN	STATUTE	1715	0261	1350	980	735	490 370 245 125	MAXIMUM AI	R. P. M. INCHES TURE			1900 F.T. A.R. 1850 F.T. A.R.	LEGEND TITUDE F.R.: SSURE A.R.: HOUR A.L.: D C.L.: F.T.:	TO REVISION AFTER
EXTERNAL ELLER F ENGINES	IS FOR EME GIVE PROGR ILES PER GA UE AIRSPEED E VALUES AR BTAIN BRITI	4.) BY 10	FUEL	U.S.	GAL.	1400	1200		800	500	400 300 200 100	PRESS	ALT. FEET	40000 35000 30000	25000 20000 15000	10000 5000 S. L.	PRESSURE ALTI MAN IFOLD PRES U.S.GAL. PER H TRUE AIRSPEED KNOTS SEA LEVEL	
I PROPE NUMBER OF	NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEE II, III, IV AND V GIVE PROGRESSIVE INCREASE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE AP REFERENCE. RANGE VALUES ARE FOR AN AVERAGE (NO WIND). TO OBTAIN BRITISH IMPERIAL GAL.		١٨	IRMILES	NAUTICAL	1260	1080	066	720	540	360 270 180 90	/GAL.)	APPROX. T.A.S. PH. MPH. KTS.	•		145 150 133 150 154 137 145 149 132	ALT. : P M.P. : M GPH : U TAS : T KTS. : K	LIMINARY, DATA, SUBJECT
TION 5,000 POUNDS	FUEL C FOR CR ANGE ANGE L AIR E NEAR	FOLD PRESSURE	COLUMN	RANGE IN A	STATUTE	CRUIS	1245	1035	830	620 520	415 310 205 105	H06.)	R.P.M. INCHES TURE			2350 F.T. AR 2150 F.T. AR 2200 40.0 AR	AL.OF FUEL ALTITUDE PRESSURE BLOWER	FIGURES ARE PRE
STRUCTI OPERA	SELECT FIGURE 1 OF FUEL TO BE US R LEFT AND SELECT STATUTE OR NAUT! W AND OPPOSITE VA	QUIRED.	MN 111	AIRMILES	NAUTICAL	NOT AVAILABLE FOR						MAUT.) MI./GAL.)	RE TOT. T.A.S.				EXAMPLE WEIGHT WITH 1000 G AIRMILES AT 5000 FT AND F.T.IN.MANIFOLD AUTO-RICH. LOW	RED
OPERATION IN INGLE ENGINE GHT LIMITS: 40,000	FOR USING CHAR LESS THAN AMOUN TALLY TO RIGHT GREATER THAN TH VERTICALLY BEL	UISING ALTITUDE (AL	COLUMN	RANGE IN	STATUTE	FUEL ALLOWANCES						(STAT. (R. P. H. P. MIX-				AT 38,000LB.GROSS TO FLY 1100STAT.	
FLIGHT (SIP	EQUAL TO OR MOVE HORIZON EQUAL TO OR TO BE FLOWN.	(M. P.) AND	HN 11	AIRMILES	NAUTICAL	SUBTRACT						IAUT.) MI./GAL.)	TOT.				27) D.	
	CYL. G.P.H. G. P.H. G.	260 290 FOWER POWER	COLUMN	RANGE IN	STATUTE							(STAT. ()	R.P.M. INCHES TURE				OFF & CLIMB (SEE FIG. 27) AND COMBAT AS REQUIRED. ANY LIME ONLY	ELIGHT TEST
ES ES (258G) (258G)	TIME	2	FUEL	u.s.	GAL.	1400	300	0000	800	900	2000 2000 2000 2000	ppres		#0000 35000 30000	25000 20000 15000	10000 5000 3. L.	TAKE- ERVE	
AIRCRAFT MOD C-46 SERI C-151	P. BLOWER MIXTU	51.0 LOW AR	COLUMN I	N AIRMILES	NAUTICAL	0#6	805	740 670 670	540	335	270 200 135 65	CONTINUOUS	TURE TOT. T.A.S.		AR 190 150 133	AR 205 159 141 AR 190 169 150 AR 175 160 142	MAKE ALLOWANCE PLUS ALLOWANCE USE HIGH BL	3/8/45 BASED ON:
AAFHC-528	G. B.W.	POWER 2700	100	RANGE IN	STAUTE	1080	930	850 775 695	620	465 385	310 230 155 75	MOM	12	•	2400 F.T. A	2400 42.0 A 2400 42.0 A 2400 42.0 A	(E)	DATA AS OF

Figure 28 (Sheet 7 of 8 Sheets)-Flight Operation Instruction Chart

ENGINE (S):	LIMITS R.P.M. IN. HG.	WAR EMERG.	MILITARY 2700 51.0	COLUMN	=	STAUTE			595 510 425	255 170 85	MOM	R. P. M. N. MIX-		F.T. A.R.	2400 42.0 A.R. 20 2400 42.0 A.R. 19 2400 42.0 A.R. 17		(1) MAKE ALL((2) USE HI (2) USE HI (3) WSE HI
C-46 SR-2800	BLOWER MI POSITION POS		D LOW AR		AIRMILES	NAUTICAL			515	295 220 145 75	CONTINUOUS	TOT. T.A.S. GPH. MPH. KTS.		_	205 173 153 190 179 159 175 168 149	SPE	DWANCE FOR DWANCE FOR GN BLOWE
MODEL(S) SERIES -51(288G) -75(288G)	MIXTURE TIME POSITION LIMIT		un	FUEL	U.S.	GAL.			700	300	PRESS	ALT. FEET	30000 30000	25000 20000 15000	10000 5000 S. L.	SPECIAL NO	WARM-UP, TAKE-OFF & WIND, RESERVE AND CR A 80VE HEAVY
(9)	HP. G.P.H.	AILS S'LENT C	260 290 FOR DET POWER P	COLUMN	RANGE IN	STATUTE					(STAT. (NA	R. P. M. P. MIX-				NOTES	OFF & CLIMB (SEE FIG.27 AND COMBAT AS REQUIRED. AVY LINE ONLY GHT TEST
FLIGHT O	INSTRUCTIONS	HOR 120N	DESIRED CRUIS (M. P.) AND MI)	N	AIRMILES	NAUTICAL	SUBTRACT				AUT.) MI./GAL.)	TOT. T.A.S. GRH. MPH. KTS.					
FLIGHT OPERATION SINGLE ENG CHART WEIGHT LIMITS: 35	S FOR USING CHART:	TER THAN	UISING ALTITUDE (A	COLUMN	RANGE	STATUTE	FUEL ALLOWANCES				(STAT. (R. P. M. P. MIX-					TO FLY 600 STAT. AIRMILES AT SMITH MINTAIN 2000 RPM AND F. TLM.
FION INSTRUCTION CHART ENGINE OPERATION S: 35,000 TO 30,000 POUNDS	SELECT FIG	R LEFT AND STATUTE OR	E (ALT.) READ RPM. G REQUIRED.	III NMI	IN AIRMILES	NAUTICAL	NOT AVAILABLE				NAUT.) MI./GAL.)	TOT. T.A GPH. MPH.				EXAMPLE	8 08 4
RATION C	IN FUEL	SELECT RANGE	MANIFOLD		RA		E FOR CRUISING		890 765 635	380 380 255 125	(1.2	R.P.K.		2350 F.	2200 F. 2000 F. 1950 41.		OO GAL. OF FUEL OO FT. ALTITUDE WIFOLD PRESSURE LOW BLOWER
HART	COLUMN	VALUE MILES	4.4	COLUMN	NGE IN A	STATUTE	(I) OA				T. (1.11 NAUT	M.P. MIX- INCHES TURE T		.T. A.R.	.T. A.A. A.R.		
I PROF	NW I	IN SPEED. AIR	(NO WIND) TO OBTAIL	<u> </u>	IRMILES	NAUTICAL			775 665 555	330	17	TOT. T.A.S.		15 146 130	20 154 137 20 154 137 20 151 134		M. P. : 6PH : 1 TAS : KTS. : S.L. : 5
PROPELLER	I IS FOR EM	MILES PER GALLON () RUE AIRSPEED (T.A.	SE VALUES AR DBTAIN BRITI P.H.) BY 10	FUEL	U.S.	GAL.			500	300	ppres		\$5000 35000 30000	25000 20000 15000	10000 5000 1 S. L.		: PRESSURE ALTITUDE : MANIFOLD PRESSURE : U.S.GAL.PER HOUR : TRUE AIRSPEED : KNOTS : SEA LEVEL
AL LOAD ITEMS R FEATHERED	HIGH SPEE	ALLON (MI./GAL.) (NC (T.A.S.) ARE APPR	REFERENCE. RANGE VALUES ARE FOR AN AVERAGE A (NO WIND). TO OBTAIN BRITISH IMPERIAL GAL (OF U. S. GAL (OR G. P. H.) BY 10 THEN DIVIDE BY 12.	00	RANGE	STATUTE			1055 905 755	605 450 300	MAXIMUM	R. P. M. INCHES TI			2050 F.T. A. 1850 F.T. A.	LEGEND	A.R. : :
RED S. ONF	SPEED CRUISING ONLY. COLUMNS	II, III, IV AND Y GIVE PROGRESSIVE INCREASE IN RANGE AT A SACRIFICE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR	(OR G. P. H.): MULTIPLY	COLUMN V	IN AIRMILES	NAUTICAL		**	920 785 655	395 260 260	AIR RANGE	TURE TOT. T.A.S.			.R. 90136 120 .R. 90134 119 .R. 85132 117		AUTO-RICH AUTO-RECH AUTO-LEAN CRUISING LEAN MANUAL LEAN FULL THROTTLE

of 8 Sheets)-Flight Operation Instruction Chart Figure 28 (Sheet 8

