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AN 01-40AJ-1

PILOT'S HANDBOOK

FOR

ARMY MODELS

A-26B and A-26C AIRPLANES

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FORT WAYNE PRINTING CO.
FORT WAYNE, IND. 2-26-46--6,400

10 AUGUST 1945
REVISED 24 JANUARY 1946

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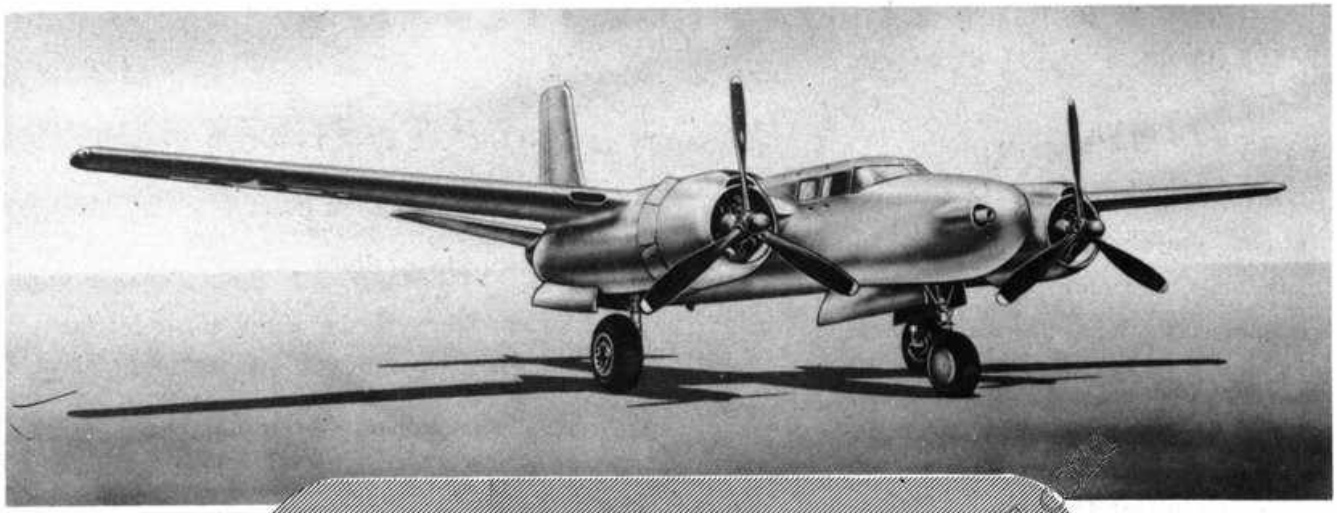


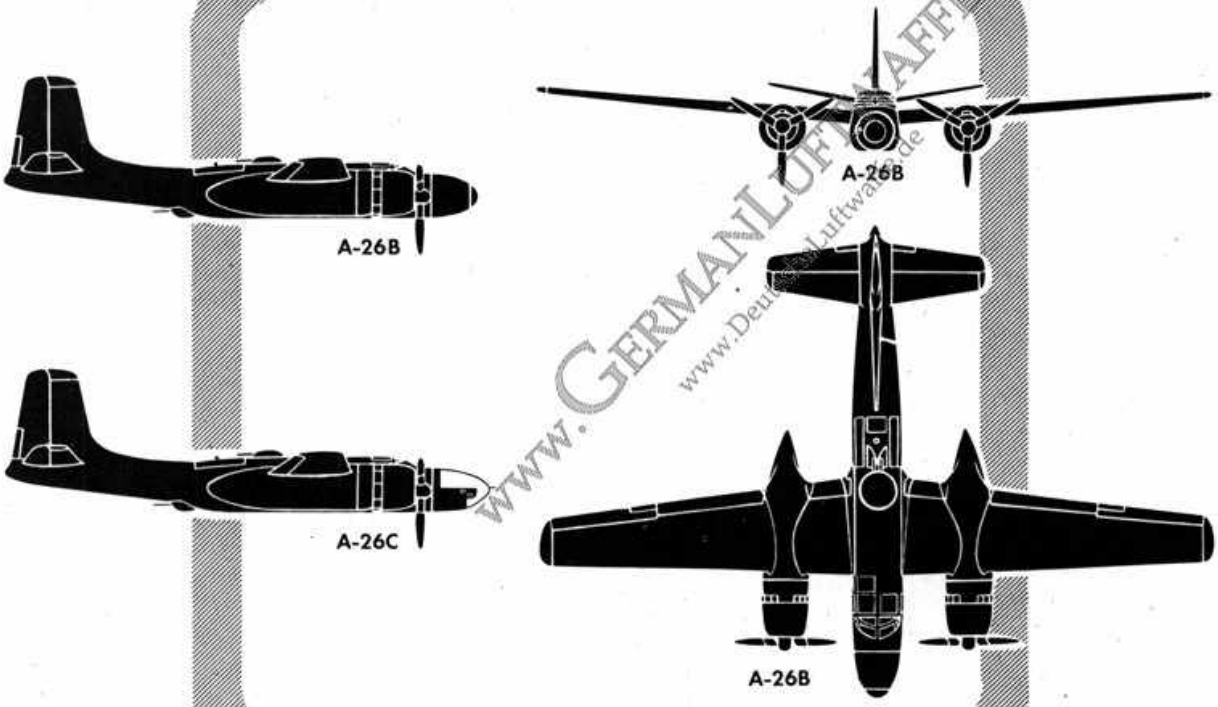
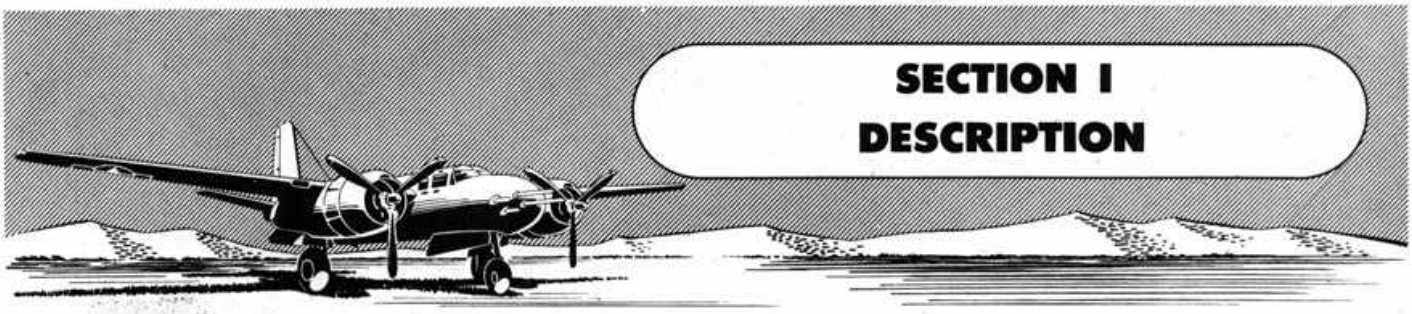


Figure 1 — A-26B and A-26C Attack Bomber Airplane



SECTION I
DESCRIPTION

1. GENERAL.

a. MODEL AND TYPE. — The A-26B attack bomber airplane is a twin-engined, mid-wing land monoplane with a tricycle type landing gear. The A-26C airplane is identical to the A-26B airplane with the exception that a bombardier's compartment nose section replaces the attack nose of the A-26B airplane. All reference to a bombardier or bombardier's compartment throughout this handbook pertains to the A-26C airplane only.

b. POWER PLANT. — The airplane is powered by two Pratt & Whitney radial 18 cylinder, double row, air-cooled engines. The engines are equipped with single stage two-speed superchargers and injection type carburetors which incorporate automatic mixture controls. Each engine is equipped with a Hamilton Standard Hydromatic, three-blade, constant speed, quick feathering propeller. The engines are designated as follows:

R-2800-27 or R-2800-71	Identical except for ignition harnesses.
or R-2800-79	Water injection provisions of War Emergency power.

c. OVERALL DIMENSIONS.

(1)	Height	18 ft. 6 in.
(2)	Span	70 ft.
(3)	Length A-26B	50 ft. 9 in.
	A-26	51 ft. 3 in.

d. CREW MEMBERS.—The crew of the A-26B airplane consists of a pilot-radio operator, and a gun loader-navigator stationed in the pilot's compartment *(figures 20, 21 and 22)* and a gunner located in an enclosed compartment *(figures 46 and 47)* aft of the bomb bay. The crew of the A-26C airplane is the same except that the gun loader-navigator is replaced by a bombardier-navigator. The bombardier normally rides on the bicycle type seat to the right of the pilot and moves to the bombardier's compartment for the actual bombing run. Crew members can move through the bomb bay while the airplane is in flight, provided a long range fuel tank, a smoke tank, SCR-522 radio set, torpedoes, or 500 or 1000 pound bombs are not being carried.

e. ACCESS TO AIRPLANE. *(Figure 2).* — On some airplanes the pilot's compartment is reached by climbing a ladder on the right-hand side of the airplane, and entering the compartment through the top of the enclosure. On other airplanes access is accomplished from the right-hand side by means of hand and footholds. Entrance to the gunner's compartment is through the bomb bay access door. When the bomb bay load interferes, the gunner climbs the ladder and enters his compartment through the top of his compartment enclosure.

2. FLIGHT CONTROLS.

a. TRIM TABS.—Trim tab control knobs and wheel *(7 and 11, figure 18)* are located on the center section of the control pedestal.

b. WING FLAPS.—The wing flaps are electrically actuated by a lever, or a toggle switch *(13, figure 17)*, located on the control pedestal. A wing flap and landing gear position indicator is provided on the instrument panel.

Note

On some airplanes an emergency flap manual control is located in the aft gunner's compartment.

c. AUTOMATIC PILOT. — Some airplanes are equipped with a Type C-1 electromechanical autopilot. The control panel is located at the aft end of the pilot's control pedestal. A "TURN CONTROL" and six indicating lights are also provided on the panel.

d. FLIGHT CONTROL LOCKS.—A surface control lock lever *(2, figure 17)*, located on the control pedestal, will lock the ailerons, elevators, and rudder control surfaces in the neutral position. Some airplanes are equipped with dual flight controls for the pilot and copilot. The dual controls consist of two control columns, two control wheels, and two sets of rudder pedals. The copilot's control wheel is detachable to allow passage from the bombardier's nose (when installed) into the pilot's compartment.

WARNING

The copilot's rudder pedals are not equipped for brake control.

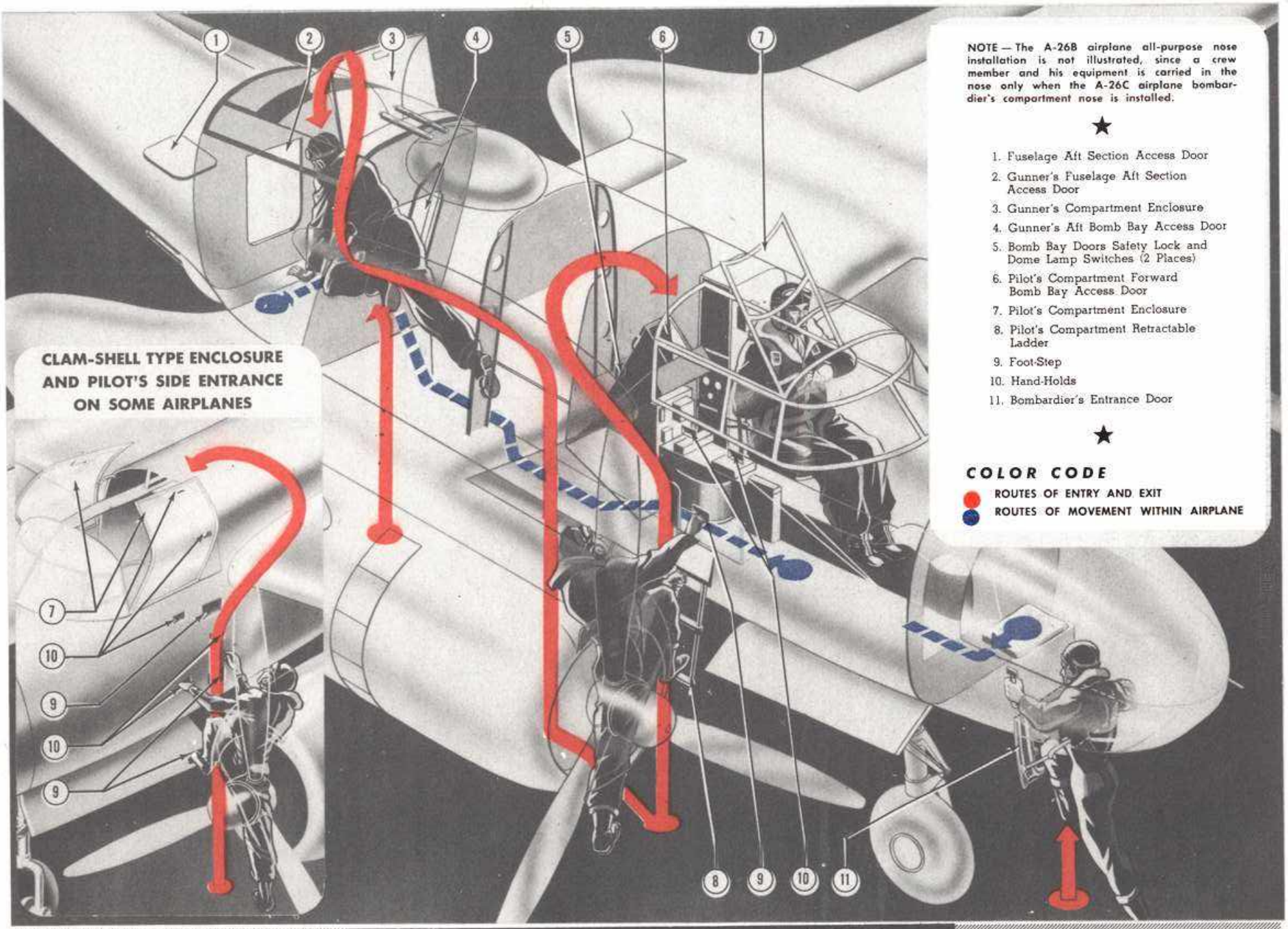
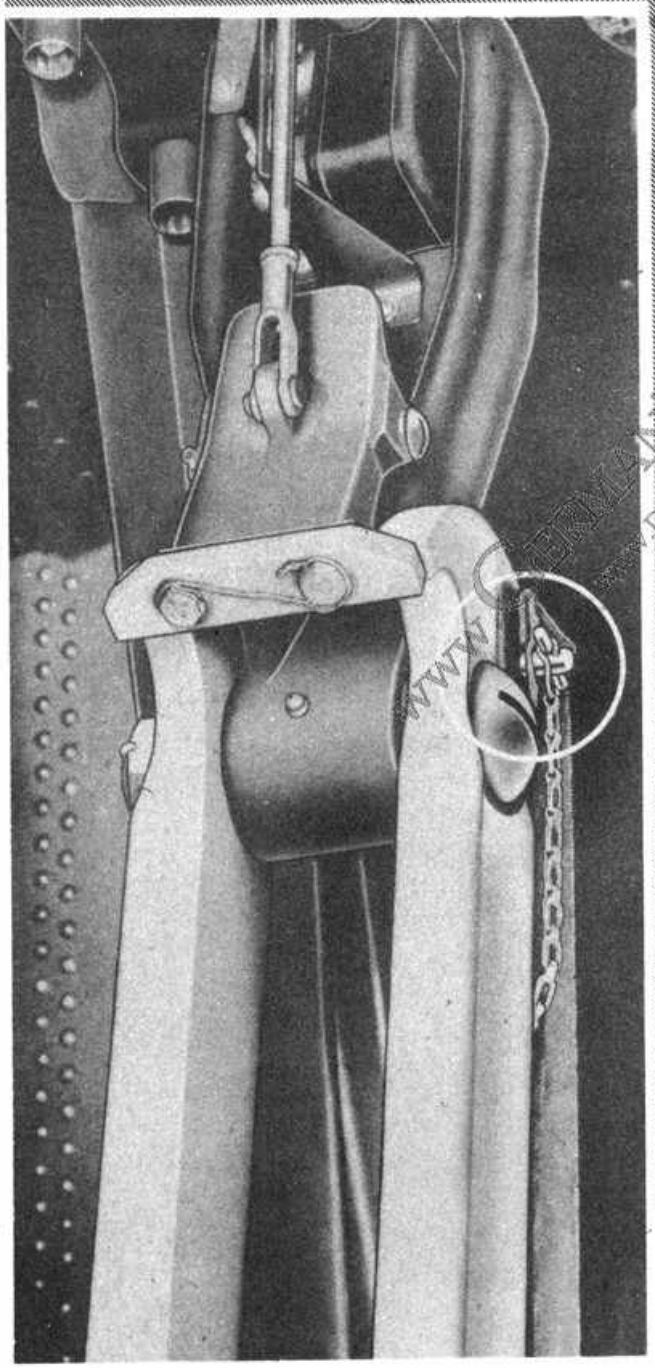
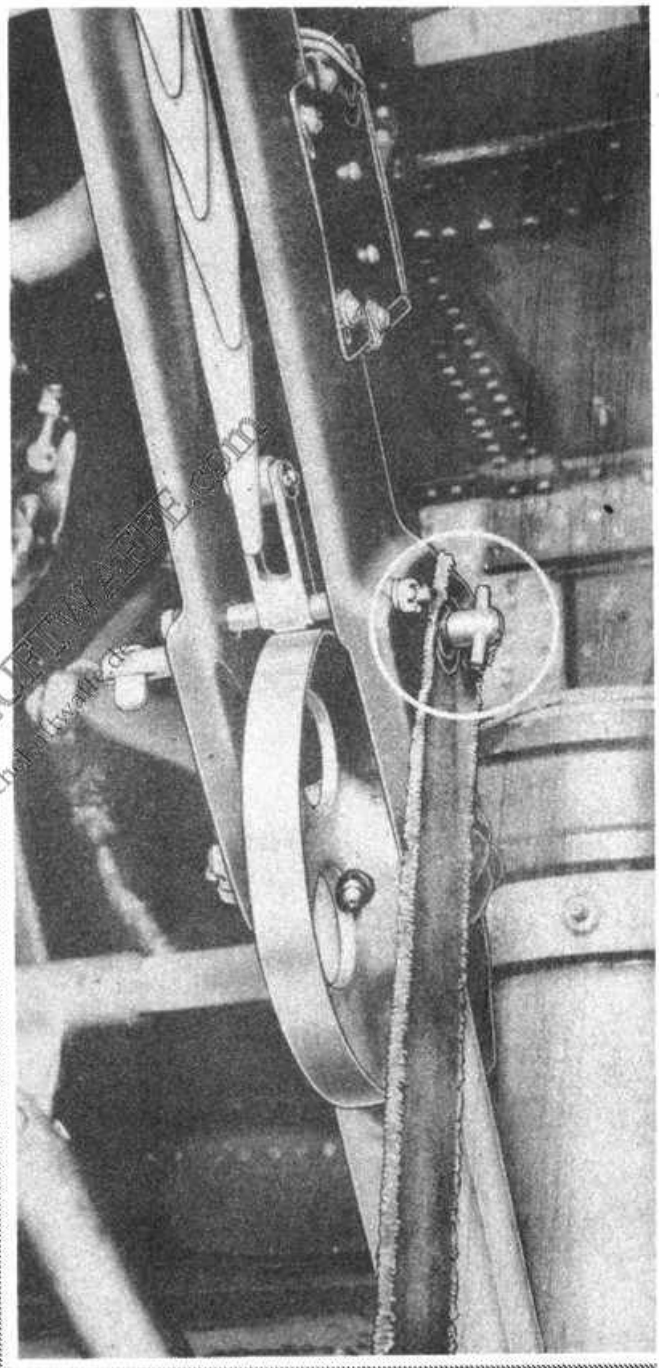


Figure 2 —Fuselage Compartments—Crew Entry and Exits Diagram

MAIN GEAR SAFETY PIN AND BLOCK





NOSE GEAR SAFETY PIN AND BLOCK

Figure 3 —Landing Gear Safety Pins and Blocks Installed

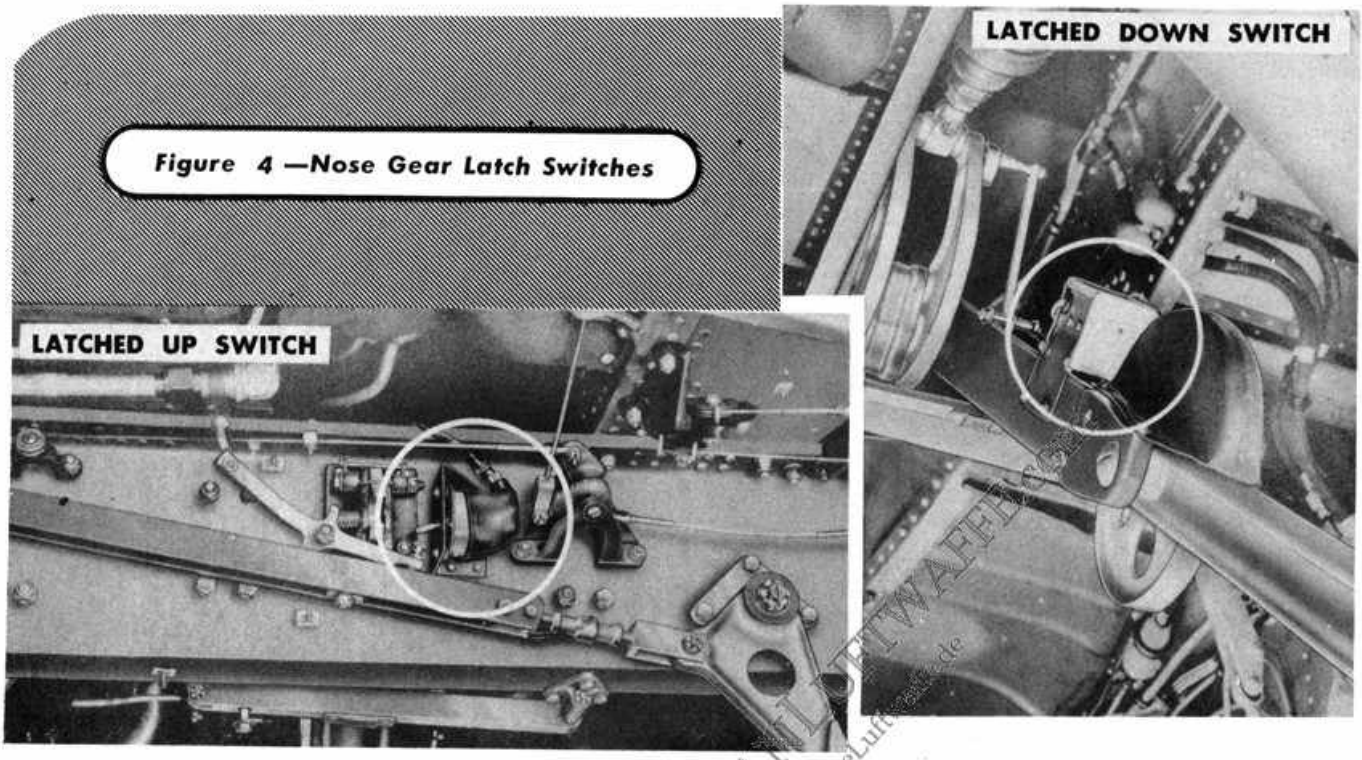


Figure 4 —Nose Gear Latch Switches

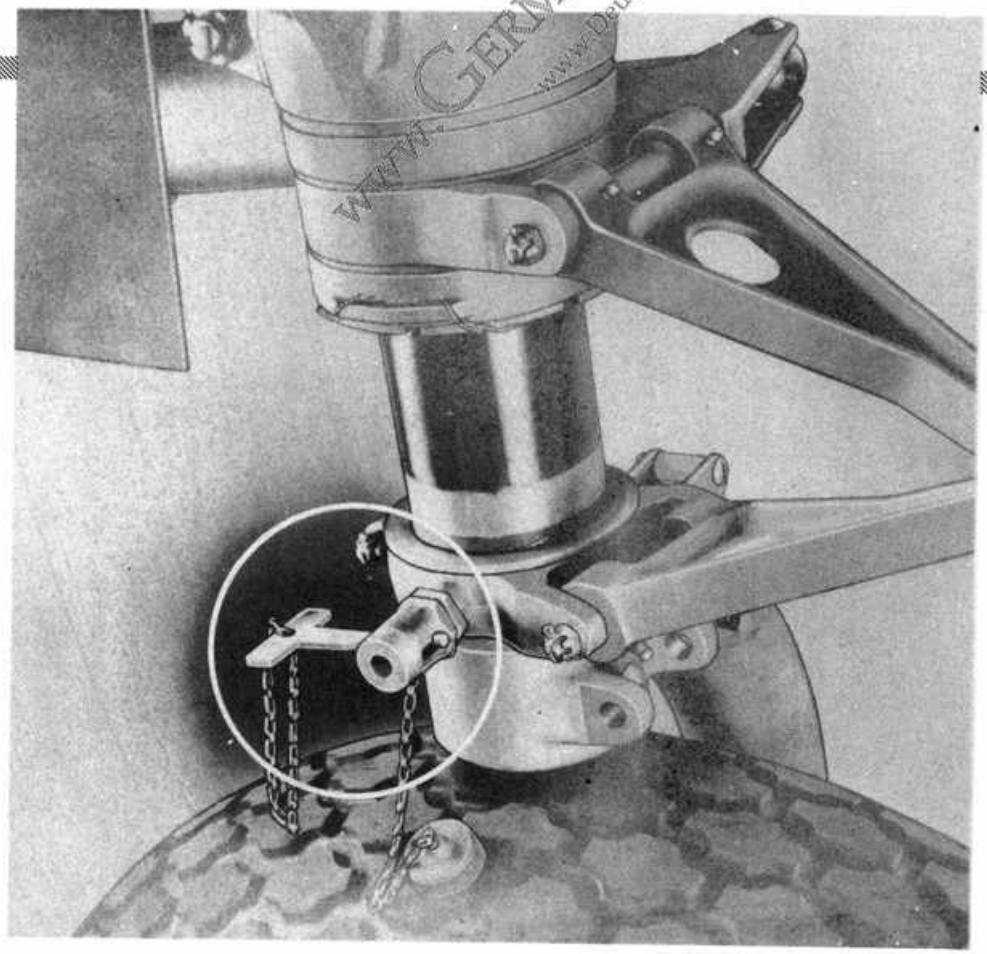


Figure 5 —Nose Wheel Snubbing Pin (Disengaged)

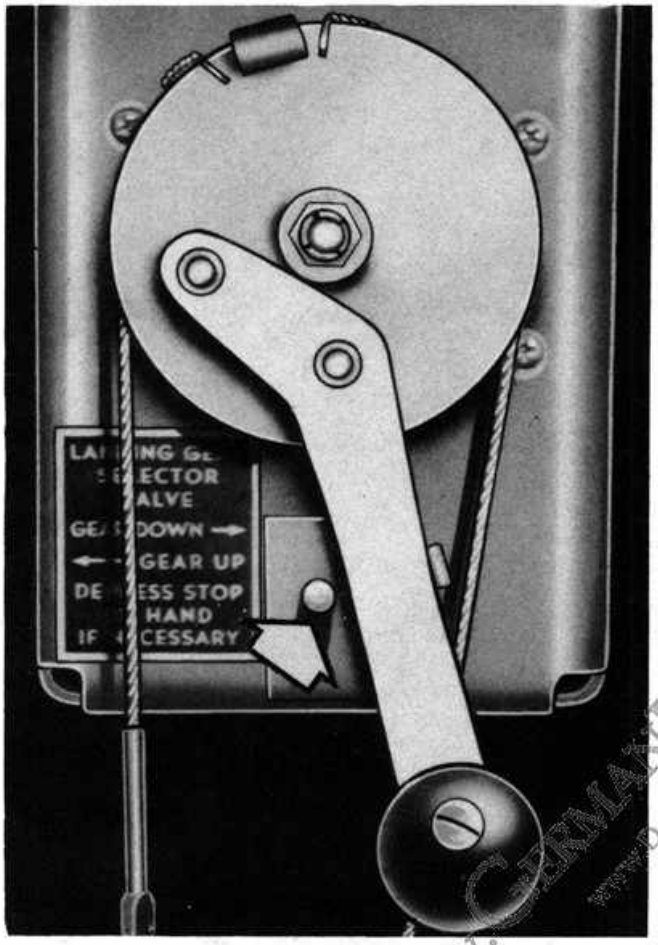


Figure 6—Landing Gear Auxiliary Control and Solenoid Locking Pin

e. AIR POSITION INDICATOR.—An air position indicator has been installed for the bombardier-navigator on some modified airplanes.

f. GYRO FLUX GATE COMPASS.—A gyro flux gate compass, with a master indicator in the nose, and a repeater indicator on the pilot's instrument panel, has been installed on certain modified airplanes.

3. LANDING GEAR CONTROLS.

The hydraulically operated, retractable landing gear is controlled by a lever *(5, figure 17)*, located on the control pedestal. The landing gear can be extended or retracted in approximately 12 seconds. An additional handle is mounted directly on the landing gear hydraulic control valve *(83, figure 21)*, located aft of the pilot and adjacent to the brake emergency air pressure gage. This control can be used to operate the landing gear in event of malfunction of the lever control system on the pedestal. The nose gear, for taxiing, is limited to 36 degrees caster each side of center by a hydraulic snubber. A manual control *(figure 30)*, is provided on the left side of the control pedestal to lower the nose gear in an emergency.

4. LANDING GEAR SAFETY DEVICES.

Safety pins are provided to be installed in the landing gear linkage when the airplane is on the ground. When not installed they are stowed in the "miscellaneous handling equipment" roll. Additional protection against inadvertent retraction is provided by a safety solenoid locking pin *(figure 6)* on the landing gear control valve auxiliary lever or the main landing gear control lever on the control pedestal. When the solenoid pin is in the extended position the landing gear control lever, or the auxiliary control lever, cannot be moved into the "UP" position. If necessary to retract the landing gear in an emergency, the lever can be actuated by manually depressing this pin.

5. LANDING GEAR WARNING SYSTEM.

Some airplanes are provided with four signal lamps for the landing gear. These are installed on the instrument panel. A green lamp for each main gear and nose gear is installed to indicate the safe LATCHED DOWN position of the gears. If the landing gear is extended and one or more of the gears is not latched down and the throttle is closed to less than one-fourth open, the red warning lamp will light, indicating an unsafe condition for landing. On airplanes with a combined wheel and wing flap position indicator, two signal lamps are provided on the instrument panel. The green lamp will light when all three gears are latched down in the "SAFE" position for landing. The red lamp will light whenever any of the gears are not latchd down and the throttle is closed to less than one-quarter open. The unlatch gear may be determined by means of the landing gear and wing flap position indicator on these airplanes. The landing gear indicator lights on late airplanes are the "push-to-test" type.

6. BRAKE CONTROLS.

The brakes are hydraulically actuated and controlled by toe-pressure applied to the top of the rudder pedals. A pull-type parking brake control *(11, figure 21)* is located on the left side of the pilot's compartment. An emergency air brake lever *(1, figure 17)* is located on the control pedestal.

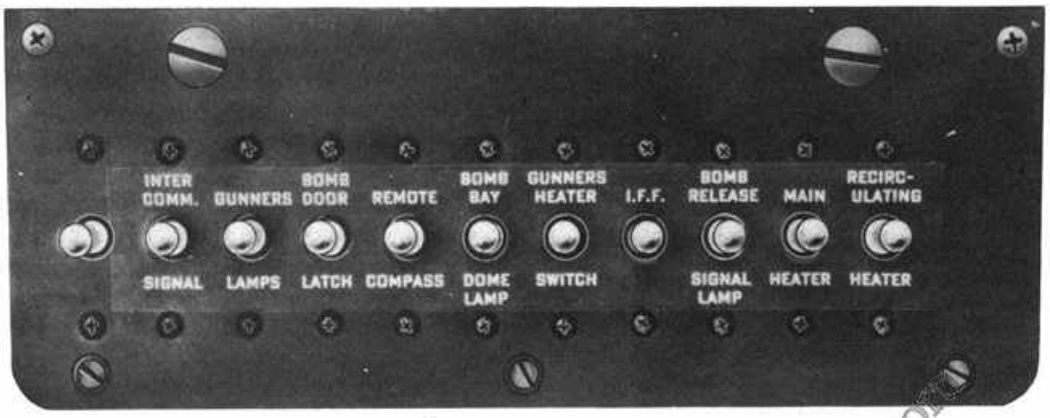
Note

When using the emergency air brake system, both brakes are applied at once; selective control is not possible.

7. HYDRAULIC SYSTEM CONTROLS.

a. GENERAL.—A pressure accumulator type hydraulic system operates the landing gear, the bomb bay doors, and the wheel brakes. A hand pump operates an emergency hydraulic system which is provided to extend the landing gear and open or close the bomb bay doors.

ON SOME AIRPLANES



ON OTHER AIRPLANES

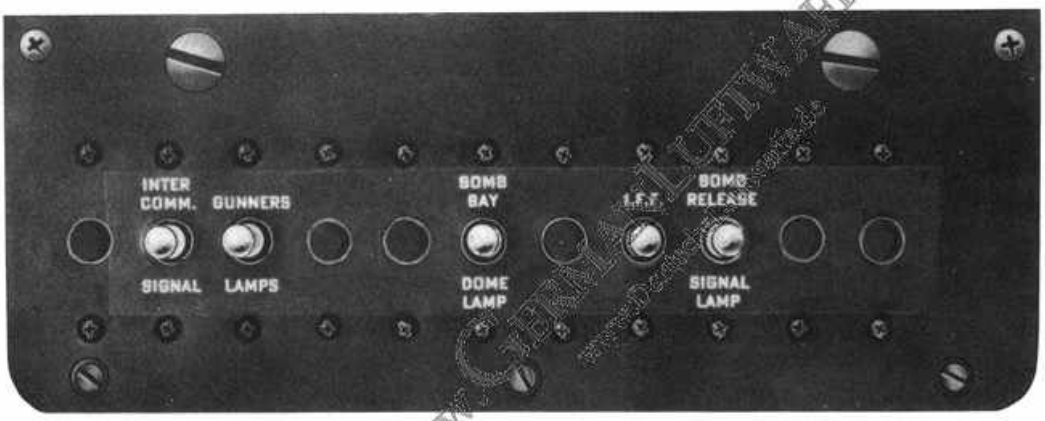


Figure 7 Fuselage Aft (Gunner's) Relay Box

b. ENGINE-DRIVEN HYDRAULIC PUMP.— Pressure for the system is provided by an engine-driven hydraulic pump on each engine. Pressure of 750-1000 pounds per square inch is maintained by a pressure regulator. Normal pressure can be maintained with only one engine-driven pump operative.

c. HYDRAULIC HAND PUMP. — The hydraulic hand pump *(16, figure 17)*, located to the right of the control pedestal, is used to increase system pressure when the engine-driven pumps are inoperative or in case of emergency.

8. ELECTRICAL SYSTEM CONTROLS.

a. GENERAL.—The electrical system is used to operate the wing flaps, cowl flaps, oil cooler doors, bomb release system and the gun turrets, in addition to the conventional operating functions. A generator is located on each engine. The controls and panels are located as shown on *figure 11*. The external power receptacle is located as shown on *39, figure 35, sheet 2.*

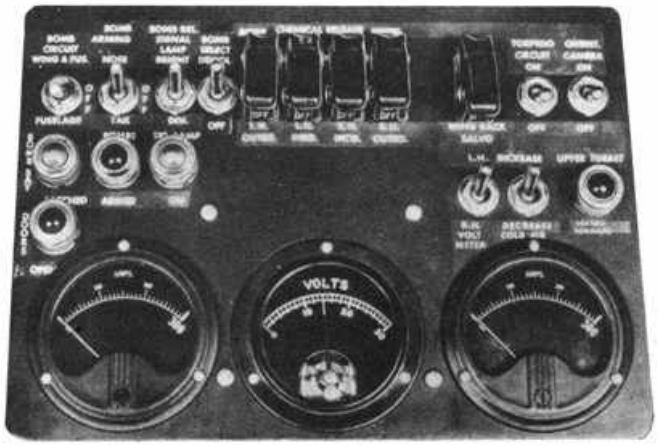


Figure 8—Pilot's Auxiliary Electrical Control Panel (Early Airplanes)

An ac power supply system is installed on some modified A-26C airplanes. The equipment consists of two rheostats, a lamp, a dc voltmeter, an ac voltmeter and a junction box, all located in the radar operator's compartment, and two inverters, one mounted in the fuselage aft section and the other in the nose compartment. On later airplanes the pilot's cockpit step has been removed from the control pedestal. This relocates the fire extinguisher electrical switches and rocket control box to the left-hand side of the airplane above the main distribution box. The booster pump, transfer pump, cowl flap, and oil cooler switches are relocated to the forward end of the pilot's control quadrant.

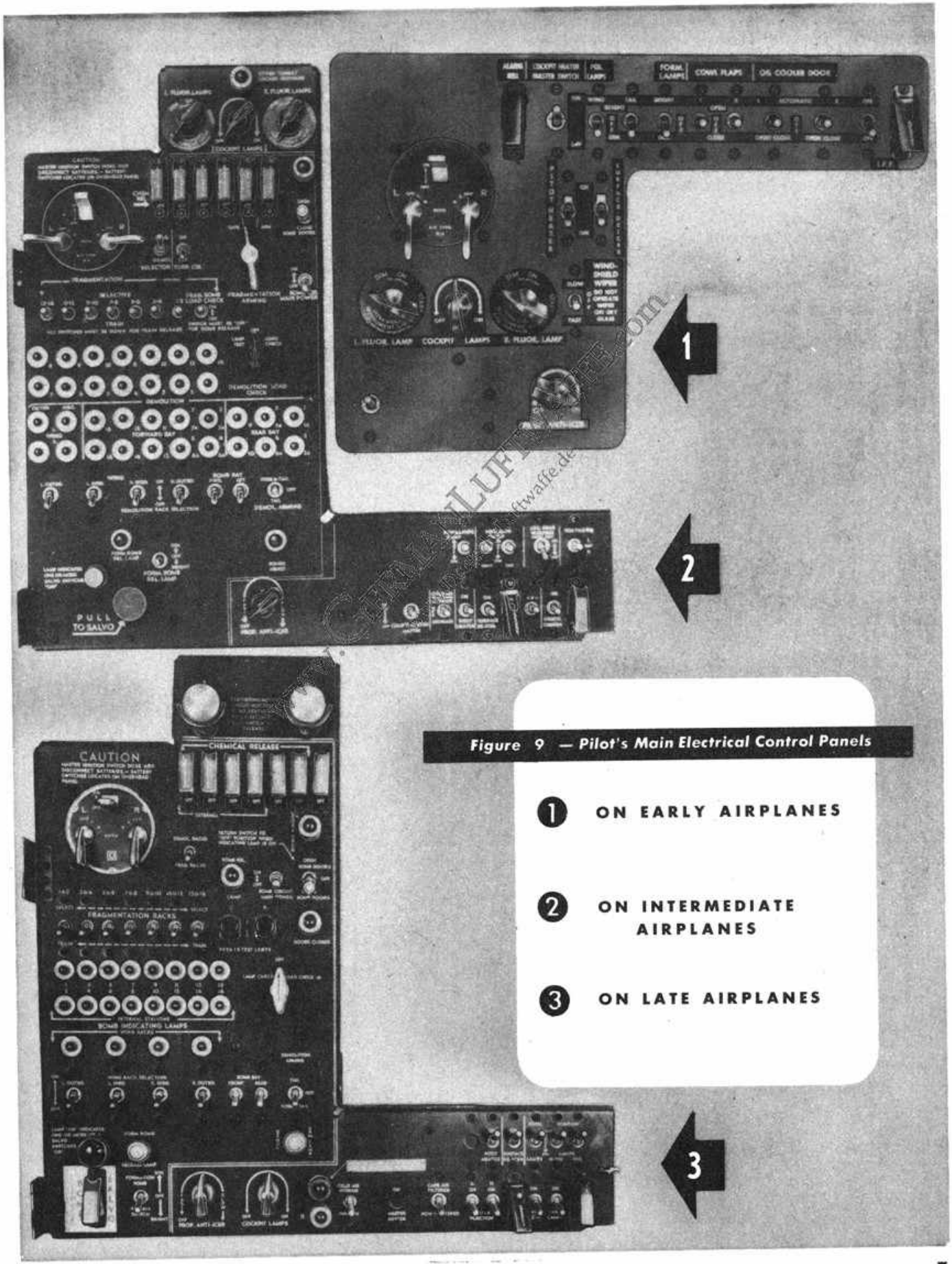


Figure 9 — Pilot's Main Electrical Control Panels

1. ON EARLY AIRPLANES
2. ON INTERMEDIATE AIRPLANES
3. ON LATE AIRPLANES

b. AUTOMATIC MOTOR SWITCHES.—The wing flap and the cowl flap electric motors incorporate bi-metal thermo overload switches. On late airplanes bi-metal thermo overload switches are provided on all electric motors in addition to those referred to above. If one of these motors becomes over-heated, the switch automatically renders the motor inoperative. The switch automatically restarts the motor after the motor cools to a temperature within its safe operating temperature range.

c. SPARE LAMPS.—Spare lamps are provided in a kit *(35, figure 20)* directly behind the pilot's seat.

9. FUEL SYSTEM CONTROLS.

(Figure 14.)

a. GENERAL.—The normal fuel supply consists of five self-sealing fuel tanks with a total fuel capacity of 925 gallons (771 Imp. gallons). Of the five tanks, the 125 gallon (104 Imp. gallons) bomb bay fuel tank is not always carried. Provisions are made in the bomb bay compartment for the installation of an additional 675 gallon (562 Imp. gallons) non-self-sealing fuel tank *(figure 15)*, for ferrying purposes. This long range fuel tank increases the total fuel capacity to 1600 gallons (1333 Imp. gallons). On some airplanes a 125 gallon aft fuselage fuel tank is installed in lieu of the lower turret. This tank has no fuel level indicator provisions. Provisions are also installed on some airplanes for the addition of a 155 gallon droppable fuel tank under each wing, which can be jettisoned by operating the bomb switch on the control wheel. No fuel gauges are provided for the wing drop tanks.

b. FUEL SELECTOR VALVES.—Three fuel selector valves *(4, 5 and 6, figure 18)* are located on the control pedestal step. One valve directs fuel from the left wing tanks, and one directs fuel from the right wing tanks. The third valve directs fuel from the bomb bay tank and acts as a cross-feed valve. A fuel transfer switch for the aft fuselage tank, if installed, and the fuel transfer switches for the wing drop tanks, if installed, are located on the step above the control pedestal.

c. ELECTRIC FUEL BOOSTER PUMPS.—Five electric booster pumps are provided, one for each tank. The pumps maintain 6-9 psi (LOW BOOST) for engine starting or 16-23 psi (HIGH BOOST) for take-offs and landings. The booster pump switches are located as shown by *7, figure 17.*

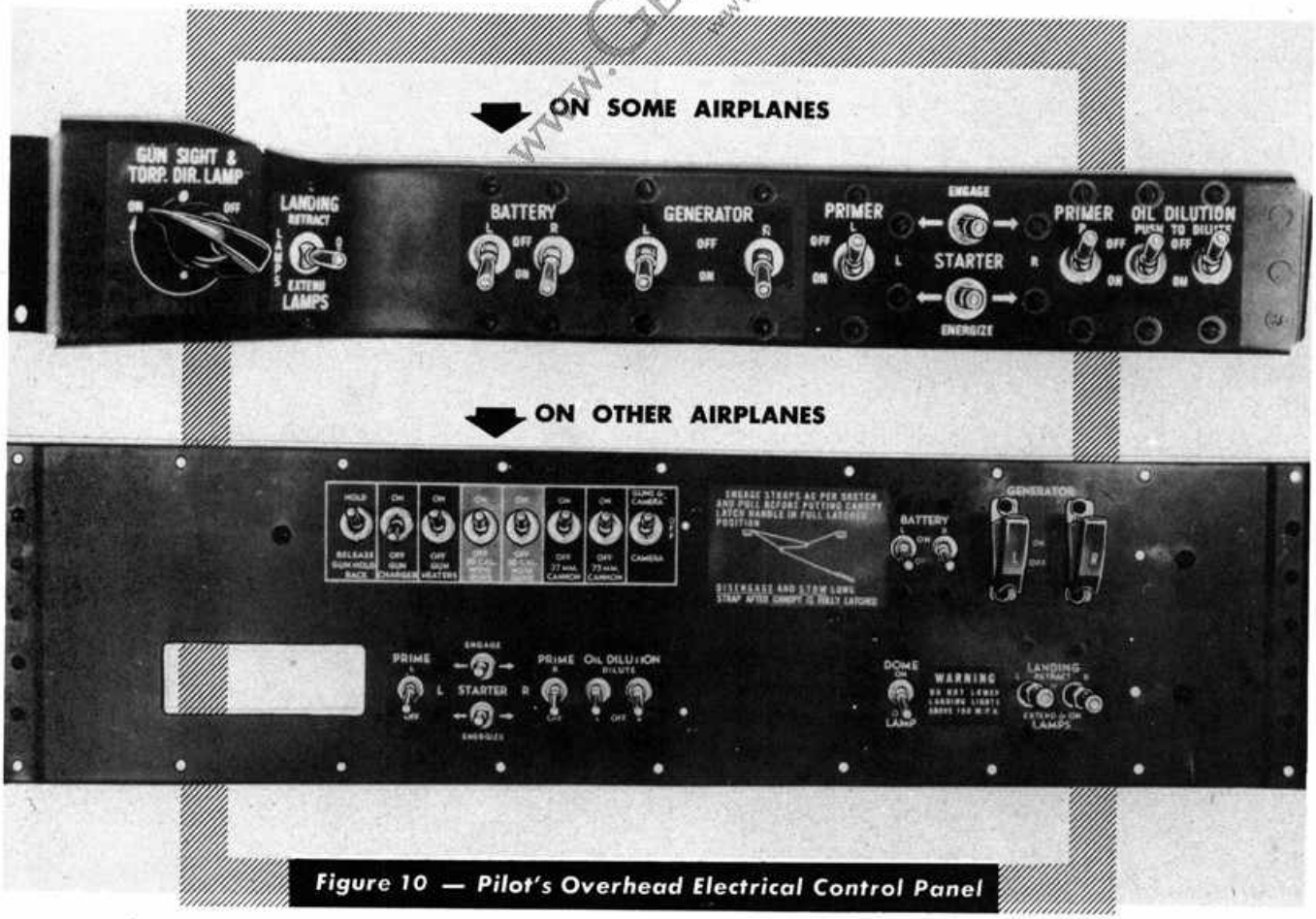
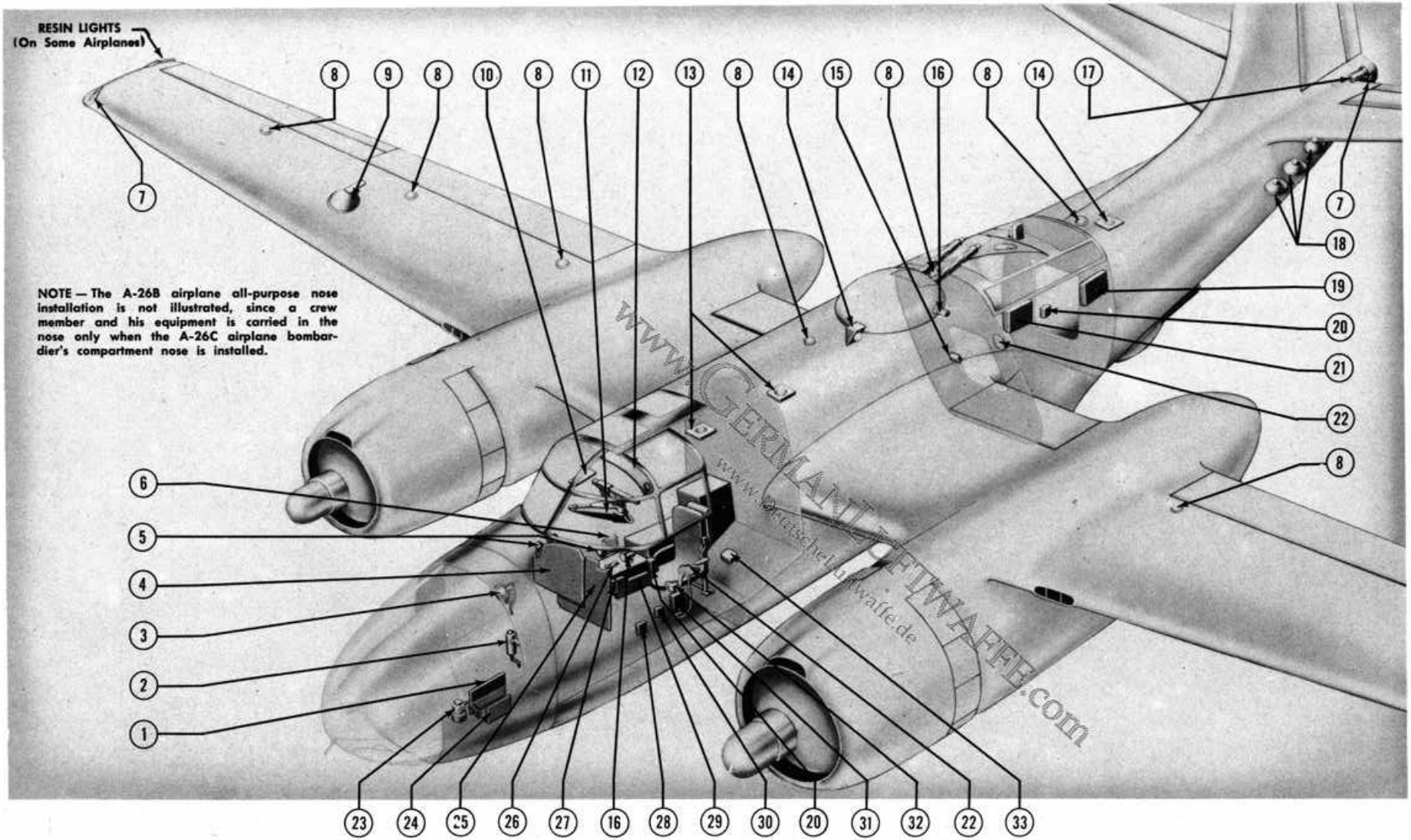


Figure 10 — Pilot's Overhead Electrical Control Panel



1. Bombardier's Electrical Panel
2. Bombardier's Cockpit Lamp
3. Bombardier's Dome Lamp
4. Pilot's Instrument Panel
5. Pilot's Instrument Panel Lamps
6. Auxiliary Switch Panel
7. Position Lamp (3 Places)
8. Formation Lamp (9 Places)
9. Landing Lamp (2 Places)
10. Pilot's Fire Control Panel
11. Torpedo Director Sight Lamp (Integral with Sight)
12. Pilot's Overhead Control Panel
13. Dome Lamp (2 Places)
14. Dome Lamp (2 Places)
15. Bomb Bay Dome Lamp Switches
16. Extension Lamp
17. Bomb Release Signal Lamp
18. Recognition Lamp (3 Places)
19. Aft Relay Junction Box
20. Intercall Signal Box
21. Turret Control Box
22. Interphone Jack Box
23. Bombardier's Fluorescent Instrument Lamp
24. Bombardier's Circuit Breaker Switch Panel
25. Pilot's Main Electrical Control Panel
26. Radio Switch Panel Lamp
27. Radio Switch Panel
28. Inter-Aircraft Signal Lamp Spare Filter Assembly
29. Pilot's Electrical Distribution Panel
30. Recognition Lights Control Box
31. Inter-Aircraft Signal Lamp Extension Cord Receptacle (On Pilot's Suit Heat Rheostat)
32. Inter-Aircraft Signal Lamp
33. Spare Lamp Box

Figure 11 — Electrical Control Panels and Lamps

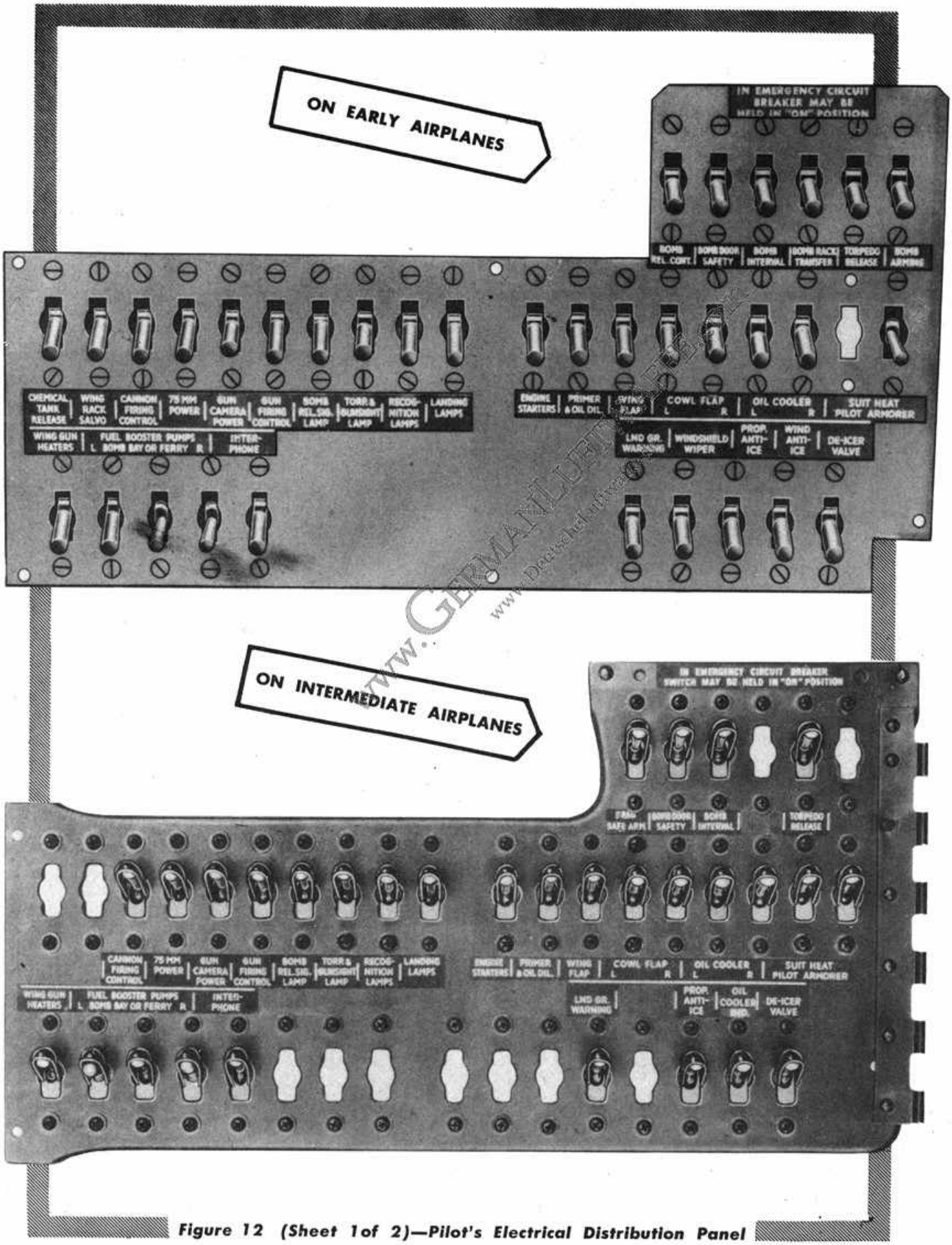


Figure 12 (Sheet 1of 2)—Pilot's Electrical Distribution Panel

Note

When operating the booster pumps in the high boost condition, the pressure is dependent upon the setting of the five rheostats, located on the control pedestal to the left of the gun loader's seat. These rheostats are preset by the ground crew to maintain the desired fuel pressures and should not be adjusted in flight.

d. PRIMERS. – Spring-loaded engine priming switches *(figure 10)* are located on the overhead electrical control panel.

e. GAGES.–Two fuel quantity gages and a dual fuel pressure gage are located on the instrument panel *(10, 17 and 20, figure 19, sheet 3)*. The long range fuel quantity gage *(3, figure 15)* is located on the control pedestal to the right of the pilot's seat or on the main instrument panel.

10. OIL SYSTEM CONTROLS.

a. OIL DILUTION SWITCHES.–Spring-loaded oil dilution switches *(figure 10)* are located on the overhead electrical control panel.

b. OIL COOLER DOOR CONTROLS. – The oil cooler doors are electrically controlled by switches *(figure 9)* located on the main electrical control panel. On some airplanes the switches are mounted on the forward side of the control pedestal step *(2, figure 18)*. The oil cooler doors will move from one extreme position to the other in 15 to 20 seconds. An oil cooler door position indicator is located on the instrument panel. Late airplanes have automatic oil cooler doors which are thermostatically controlled to maintain constant oil temperature. The switch, located on the control pedestal forward of the footstep *(2, figure 18)* should be in the "AUTO" position, for automatic temperature control. The doors may be opened or closed at will by holding the spring-loaded switch momentarily in the "OPEN" or "CLOSE" position. When released from "OPEN" or "CLOSE" the switch will return to "OFF" and the doors will remain in the selected position.

Note

Position indicators are not installed on airplanes equipped with the thermostatic control of the oil cooler doors.

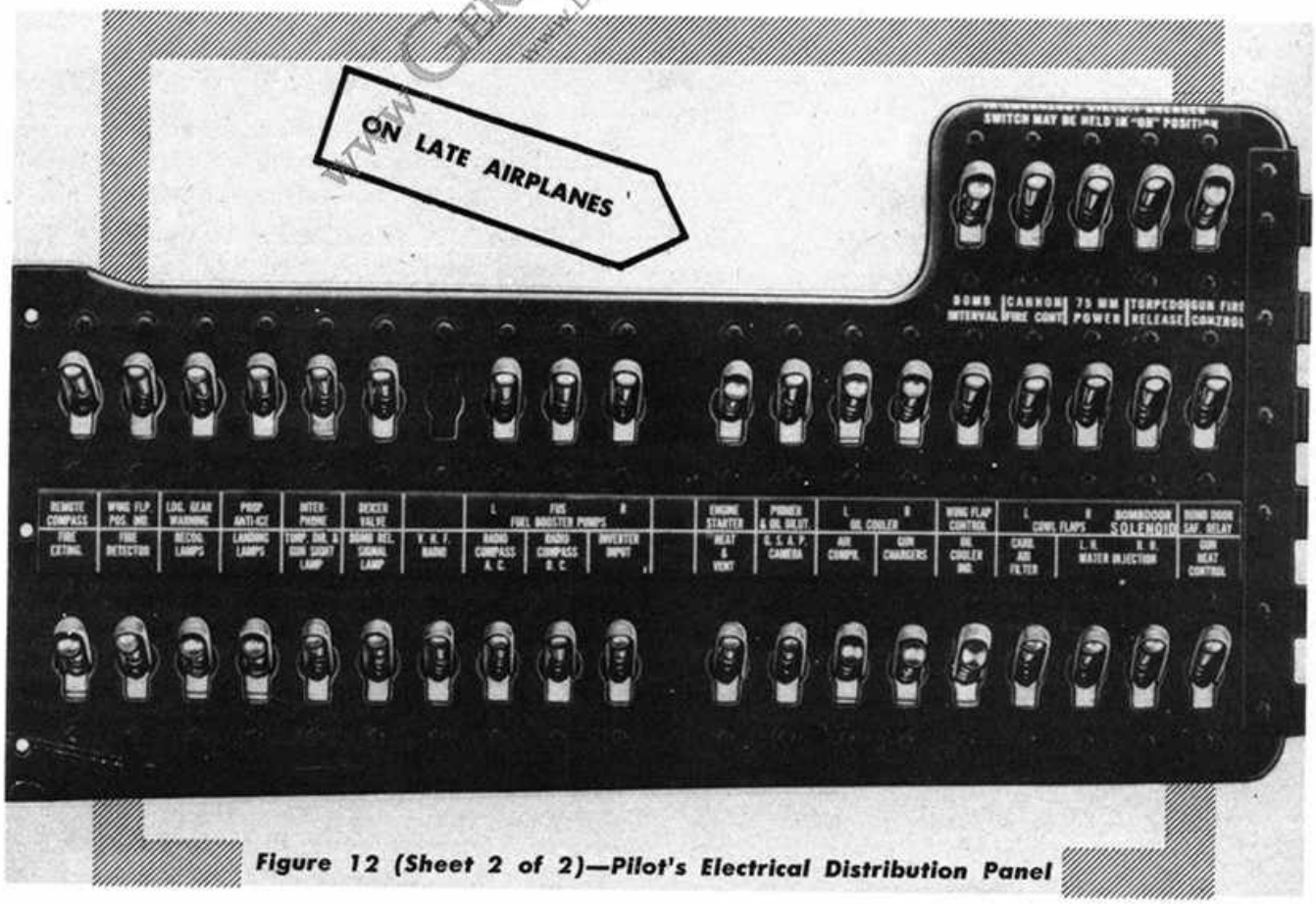


Figure 12 (Sheet 2 of 2)—Pilot's Electrical Distribution Panel

11. ENGINE CONTROLS.

(Figure 17.)

The engine controls are mounted on the control pedestal and are conventional in operation. The Stromberg carburetor installation has four mixture control positions: "IDLE CUT-OFF," "AUTO-LEAN," "AUTO-RICH," and "EMERGENCY-RICH." The "EMERGENCY-RICH" position is safetied so that this position is available only in an emergency. The lock-wire can be overcome by forcing the control clear forward.

12. CARBURETOR AIR TEMPERATURE CONTROLS.

The carburetor air temperature control levers *(14, figure 17)* are used to regulate the adjustable induction type carburetor heat mechanism to prevent carburetor idling. The levers can be set at either the full "COLD" or full "HOT" position.

13. CARBURETOR AIR FILTER CONTROLS.

Some airplanes have a ram type induction system with filters that may be installed in the ramming scoop. These filters are stowed loose in the airplane. It is recommended that the filters not be used as flight tests indicate that a loss of manifold pressure results and the engine will not develop full rated power at take-off. Late airplanes have a non-ram type induction system. This installation incorporates an air filter with a control *(15, figure 17)* located on the control pedestal to provide filtered or non-filtered air.

14. SUPERCHARGER CONTROLS.

The controls for the two-speed, single stage supercharger on each engine are located on the control pedestal.

15. COWL FLAP CONTROLS.

The electrically operated cowl flaps will move from one extreme position to the other in five to ten seconds. On some airplanes the switches *(3, figure 18)* are mounted on the forward side of the control pedestal step, while on other airplanes they are located on the main electrical control panel *(figure 9)*.

16. WATER INJECTION CONTROLS.

(Figure 16.)

On some airplanes a water injection system is used. Water pumps, located in each nacelle, are operated by a switch located on the instrument panel, and are used to circulate the water from the supply tank to the pumps and return. Switches connected to the throttles are actuated only when the throttles are against the full open throttle stops and open the lines from the pumps to the water regulator on each engine. Warning lights on the instrument panel will indicate insufficient water pressures or depleted supply.

CAUTION

War emergency power operation after depletion of water supply or loss of water pressure may cause serious damage.

17. OXYGEN SYSTEM CONTROLS.

a. GENERAL.—A low pressure, diluter-demand oxygen system is installed on some modified airplanes. Each crew member's station is equipped with a diluter-demand regulator, a pressure gage, a flow indicator, and a flexible hose to which the mask is attached.

WARNING

Keep grease and oil away from oxygen system. Oxygen mixed with grease and oil explodes violently. Do not smoke near oxygen outlets.

b. PRESSURE GAGES.—A system pressure gage is installed at each station to indicate the oxygen system pressure.

c. OXYGEN SYSTEM FLOW INDICATORS.—An oxygen system flow indicator (blinker gage) is installed at each station adjacent to the diluter-demand regulator. When oxygen is inhaled into the mask, the flow indicator blinks once for each installation.

d. OXYGEN SYSTEM REGULATORS.—One diluter-demand type regulator is installed at each station. These regulators mix air and oxygen into the proper ratio for a given altitude and in a quantity demanded by the user. On demand from user, the regulator produces air at sea level, but no oxygen. Up to 10,000 feet air only flows through the demand regulator. From 10,000 to 30,000 feet, oxygen diluted with air is delivered into the mask at a proportion necessary at the various altitudes. Above 30,000 feet the air intake of the demand regulator closes and 100% oxygen is delivered to the user's mask.

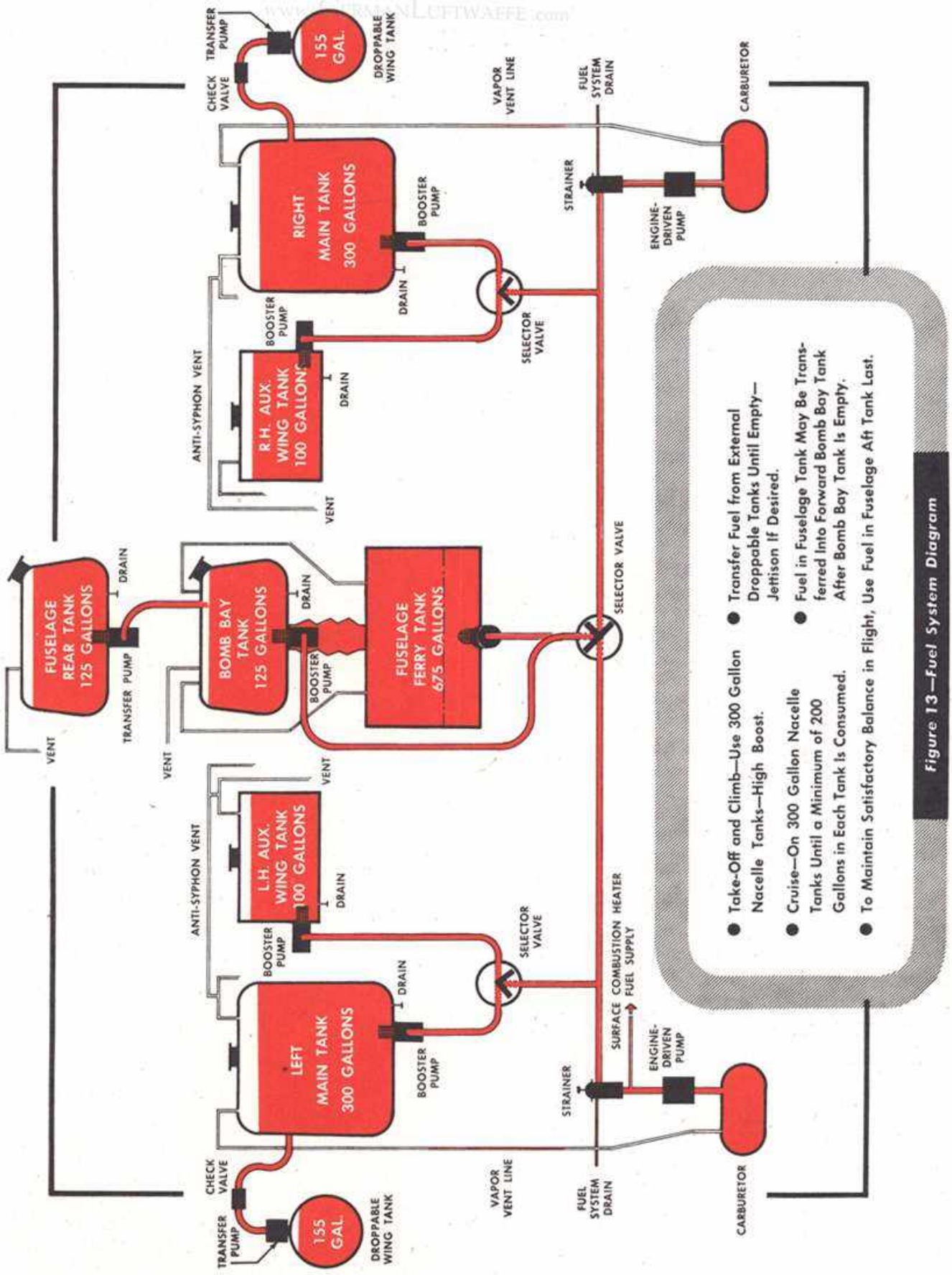


Figure 13—Fuel System Diagram

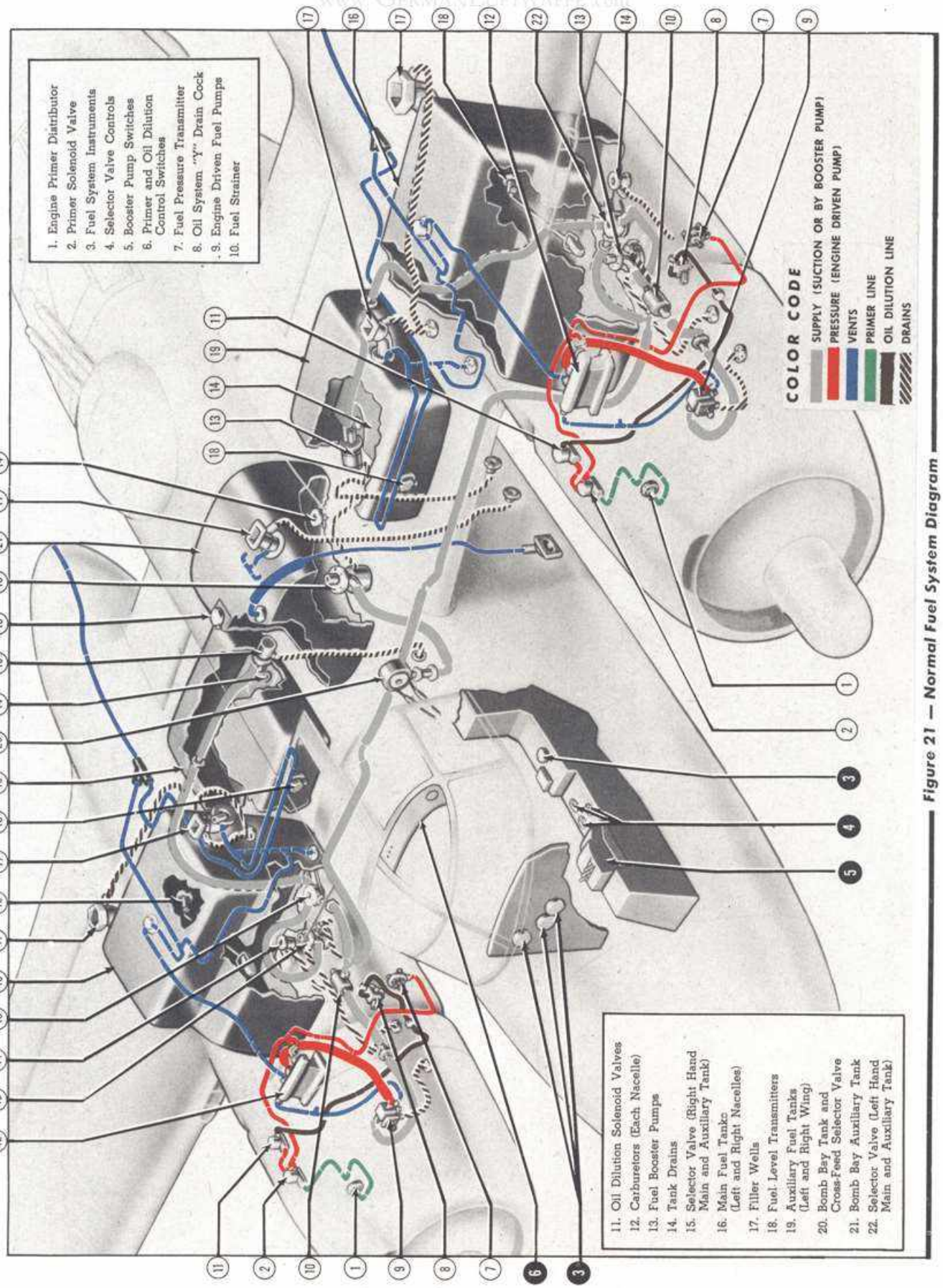


Figure 21 — Normal Fuel System Diagram

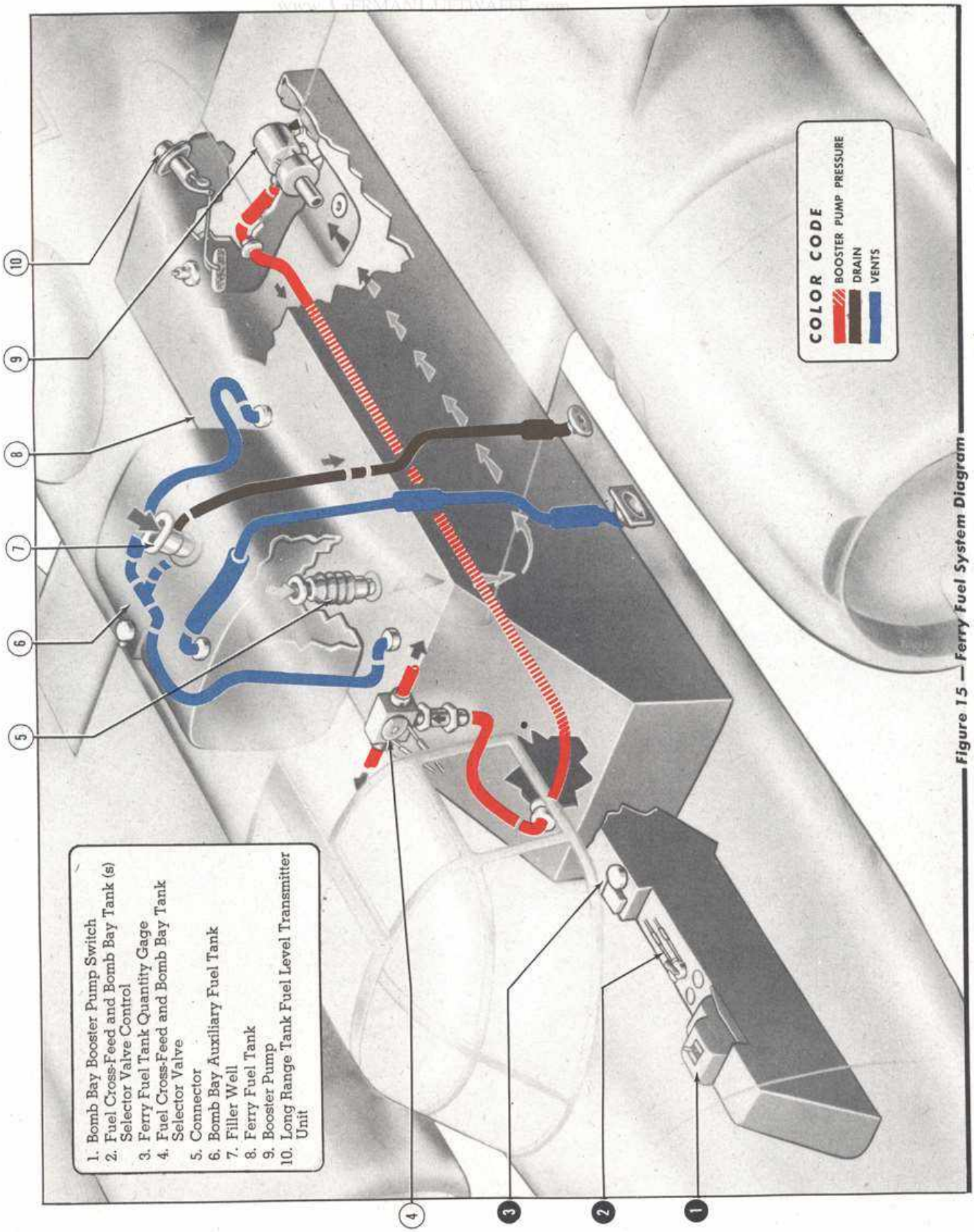


Figure 15 — Ferry Fuel System Diagram

Closing of throttle switch circuit closes the pump solenoid valve and opens the regulator solenoid valve. Water under pressure from pump is then prevented from returning to the tank and allowed to be metered by fuel pressure in the water pressure regulator.

Water pressure in the regulator closes the derichment valve in the carburetor reducing the quantity of metered fuel entering the fuel transfer line and replacing it with metered water through the water transfer line.

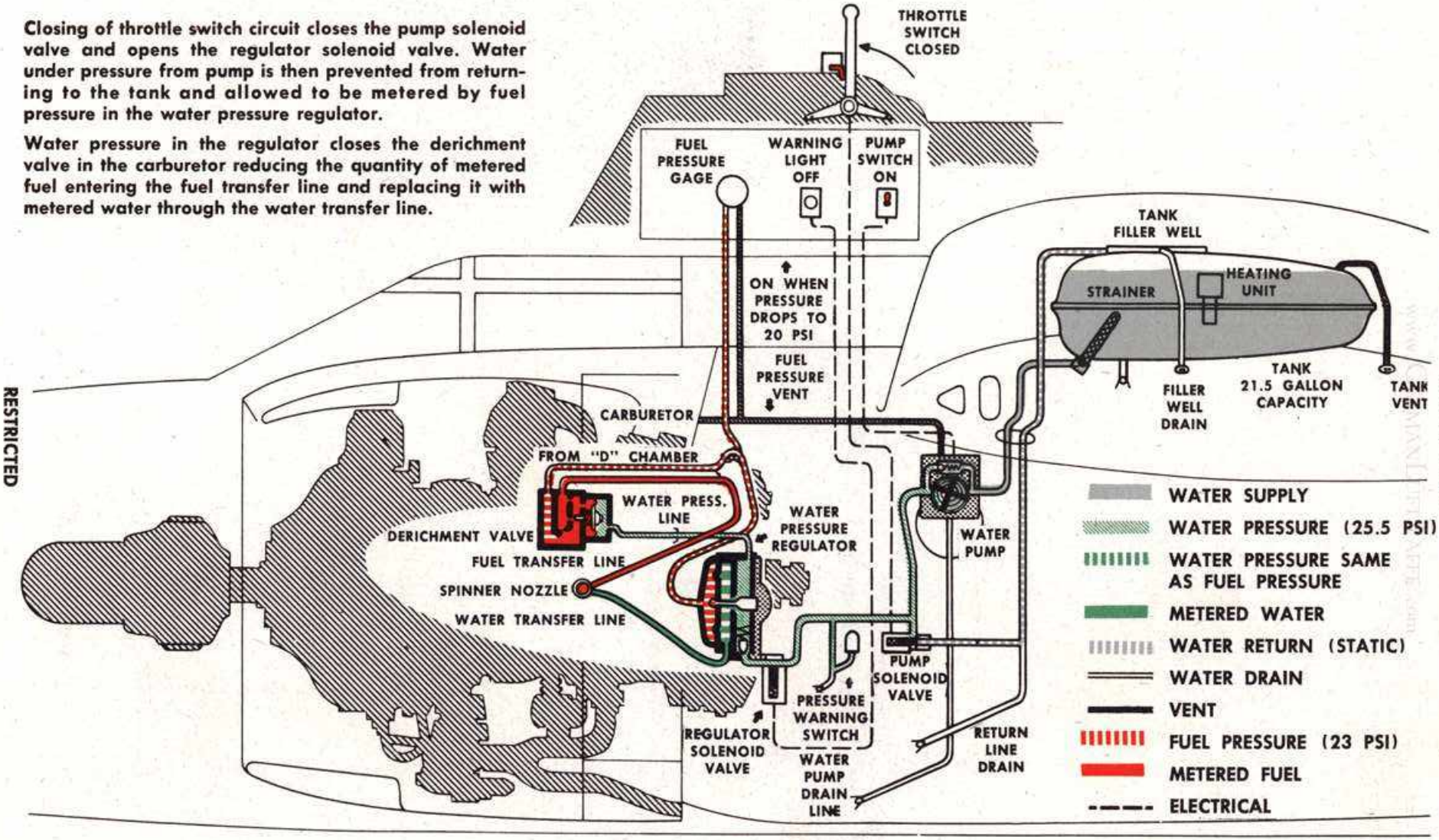
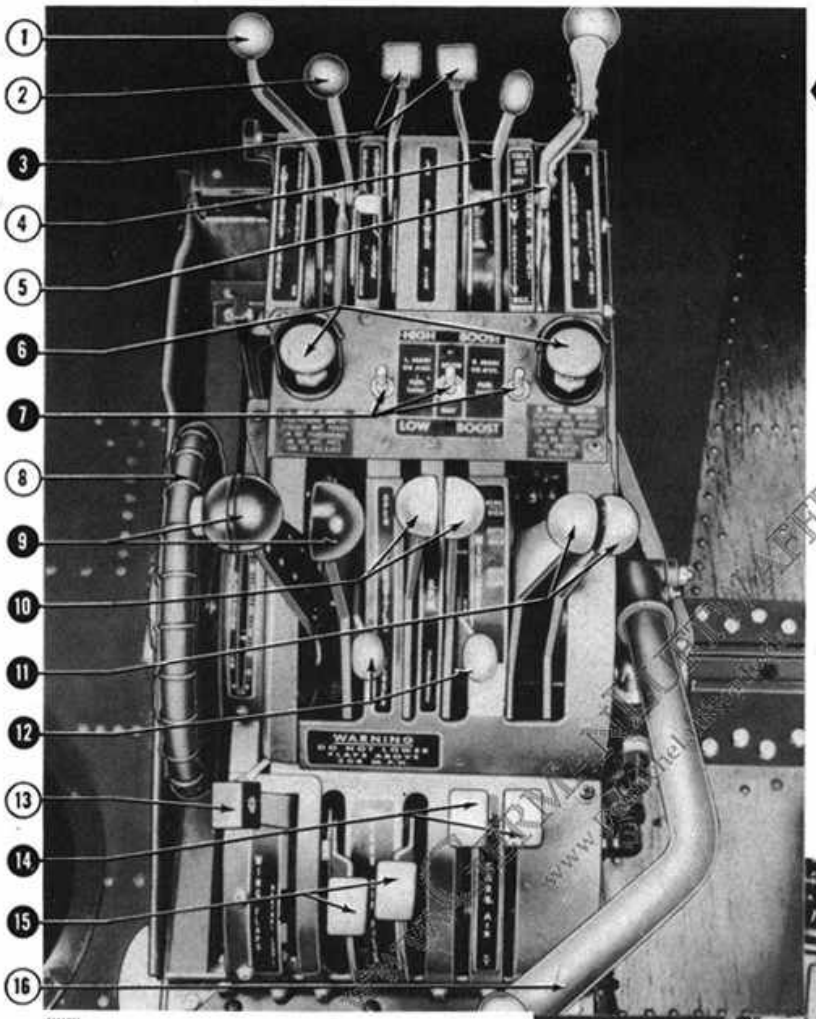
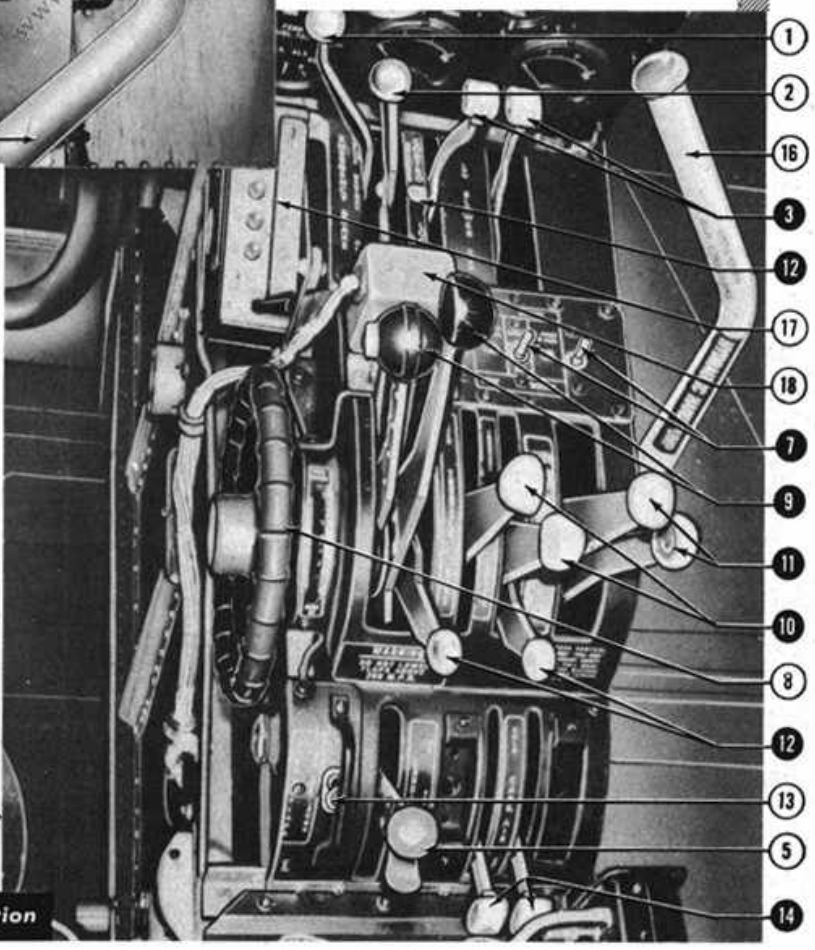


Figure 16 —Water Injection System



ON SOME AIRPLANES

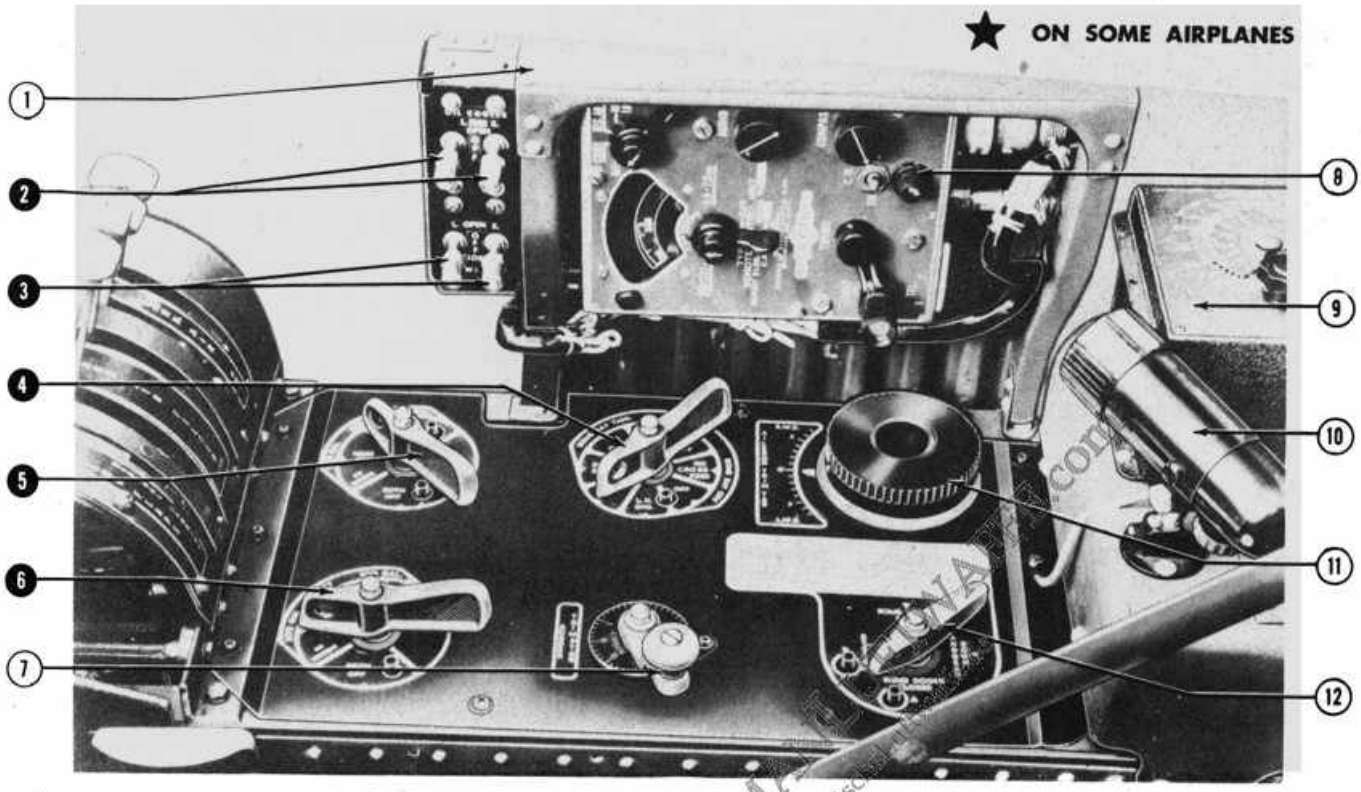
1. Emergency Airbrake Control
2. Surface Control Lock Lever
3. Supercharger Blower Ratio Controls
4. Heater Control Lever
5. Landing Gear Control
6. Propeller Feathering Buttons
7. Fuel Booster Pump Switches
8. Elevator Trim Tab Control
9. Throttle Controls
10. Propeller Governor Controls
11. Mixture Control Levers
12. Control Lock Levers



13. Wing Flap Control
14. Carburetor Air Temperature Controls
15. Carburetor Air Filter Controls
16. Hydraulic Hand Pump
17. SCR-522 Radio Control Box
18. Throttle Switch (Water Injection)

ON OTHER AIRPLANES

Figure 17 —Control Pedestal—Forward Section



1. Footstep
2. Oil Cooler Doors Switches
3. Cowl Flap Switches
4. Bomb Bay Tank Selector Valve
5. R.H. Tanks Selector Valve
6. L.H Tanks Selector Valve
7. Rudder Trim Tab Control
8. Radio Compass Remote Control Unit
9. Intervalometer
10. Extension Lamp
11. Aileron Trim Tab Control
12. Emergency Hydraulic Selector Valve
13. Bombs-Rockets Selector Switch
14. Auxiliary Electrical Control Panel
15. Fire System Control Panel

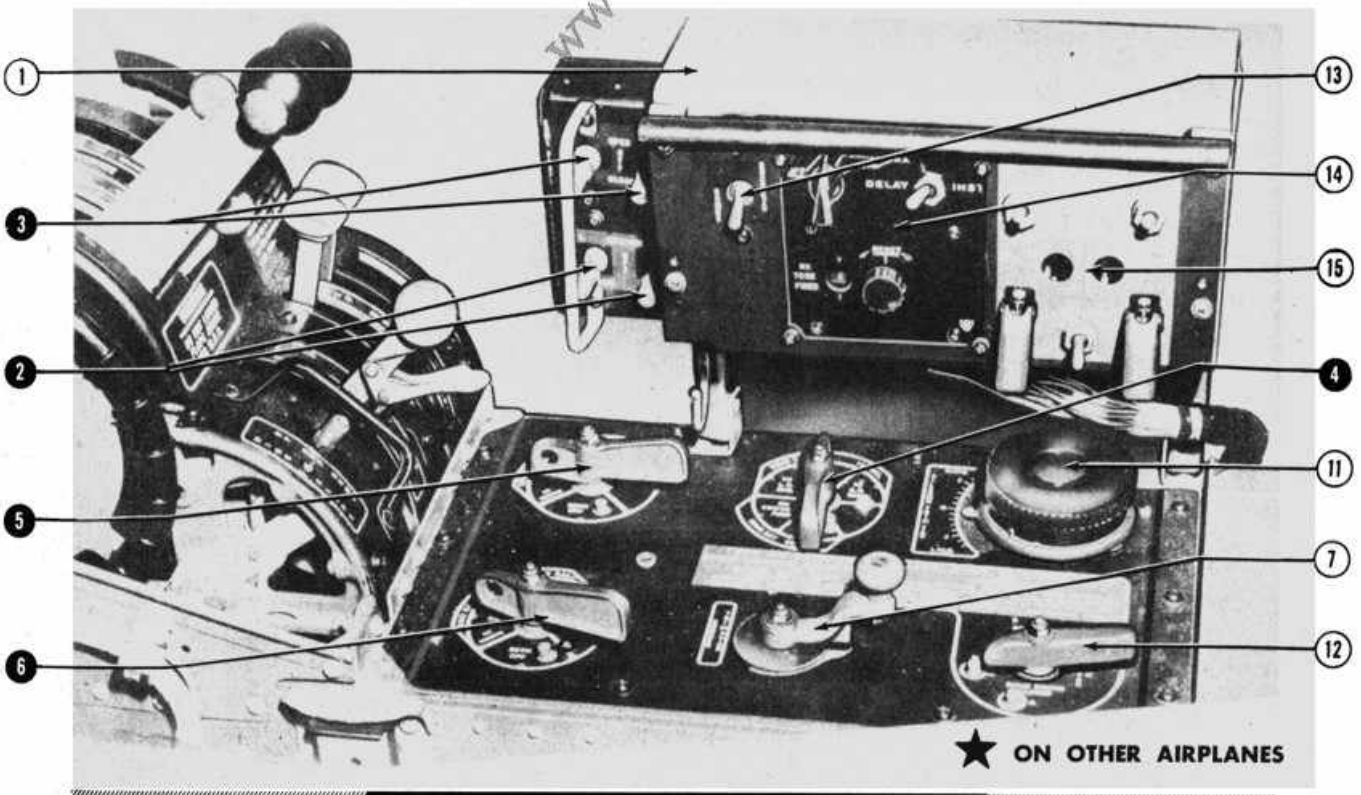
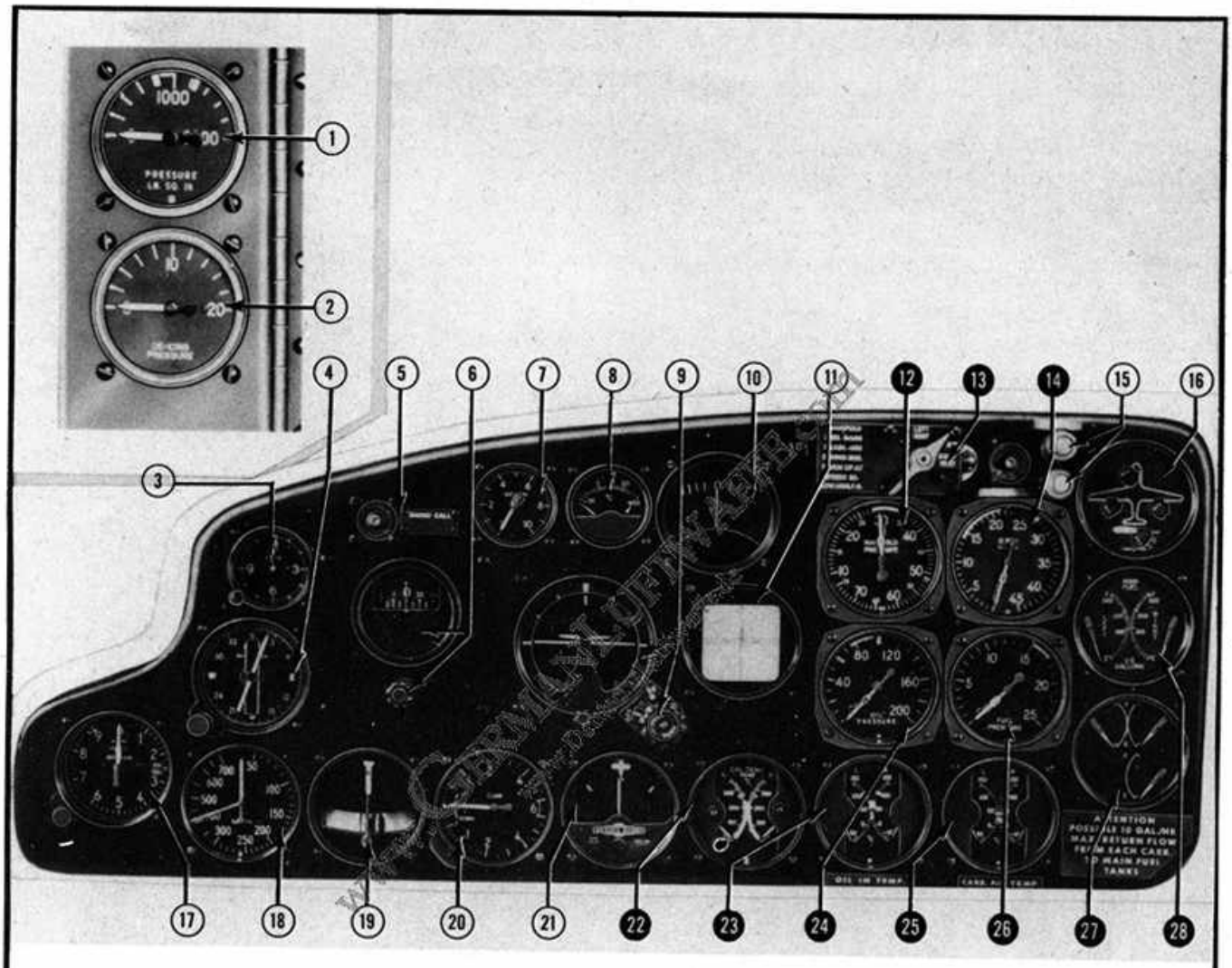


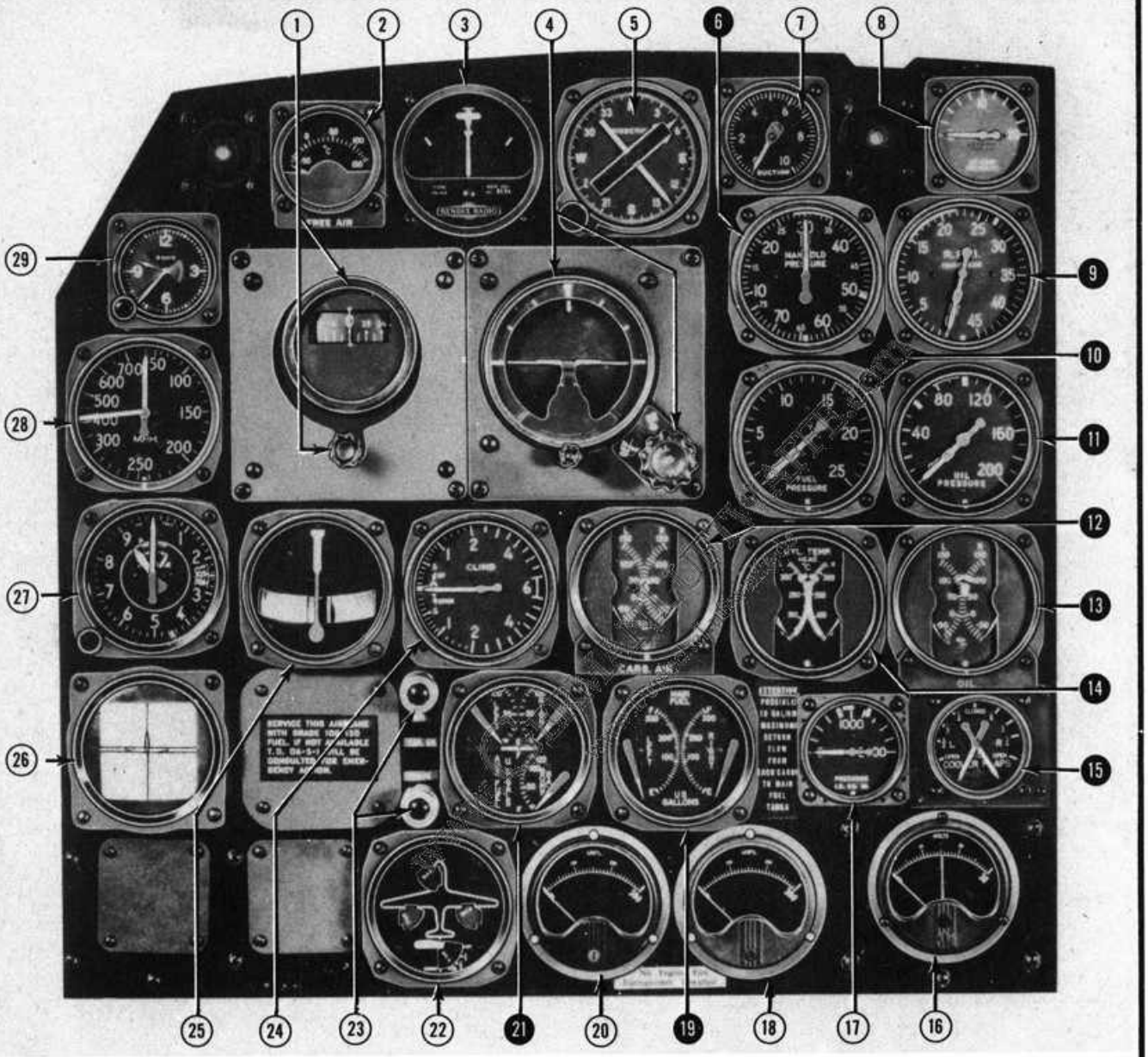
Figure 18—Control Pedestal—Center Section



1. Hydraulic System Pressure Gage
2. De-Icer System Pressure Gage
3. Clock
4. Remote Magnetic Compass Indicator
5. Radio Call Plate
6. Directional Gyro Indicator
7. Suction Gage
8. Outside (Free) Air Temperature Indicator
9. Gyro Horizon Indicator and Caging Knob
10. Oil Cooler Door Position Indicator
11. Tell-Tale Indicator
12. Manifold Pressure Gage (Dual)
13. Manifold Pressure Gage Line Drain Control
14. Tachometer Indicator (Dual)
15. Landing Gear Warning Lights
16. Landing Gear and Wing Flap Position Indicator
17. Altimeter
18. Airspeed Indicator
19. Bank and Turn Indicator
20. Rate of Climb Indicator
21. Radio Compass Left-Right Indicator
22. Cylinder Head Temperature Indicator (Dual)
23. Oil Temperature Indicator (Dual)
24. Oil Pressure Indicator (Dual)
25. Carburetor Air Temperature Indicator (Dual)
26. Fuel Pressure Indicator (Dual)
27. Auxiliary Fuel Quantity Gage
28. Main Fuel Quantity Gage

(ON EARLY AIRPLANES)

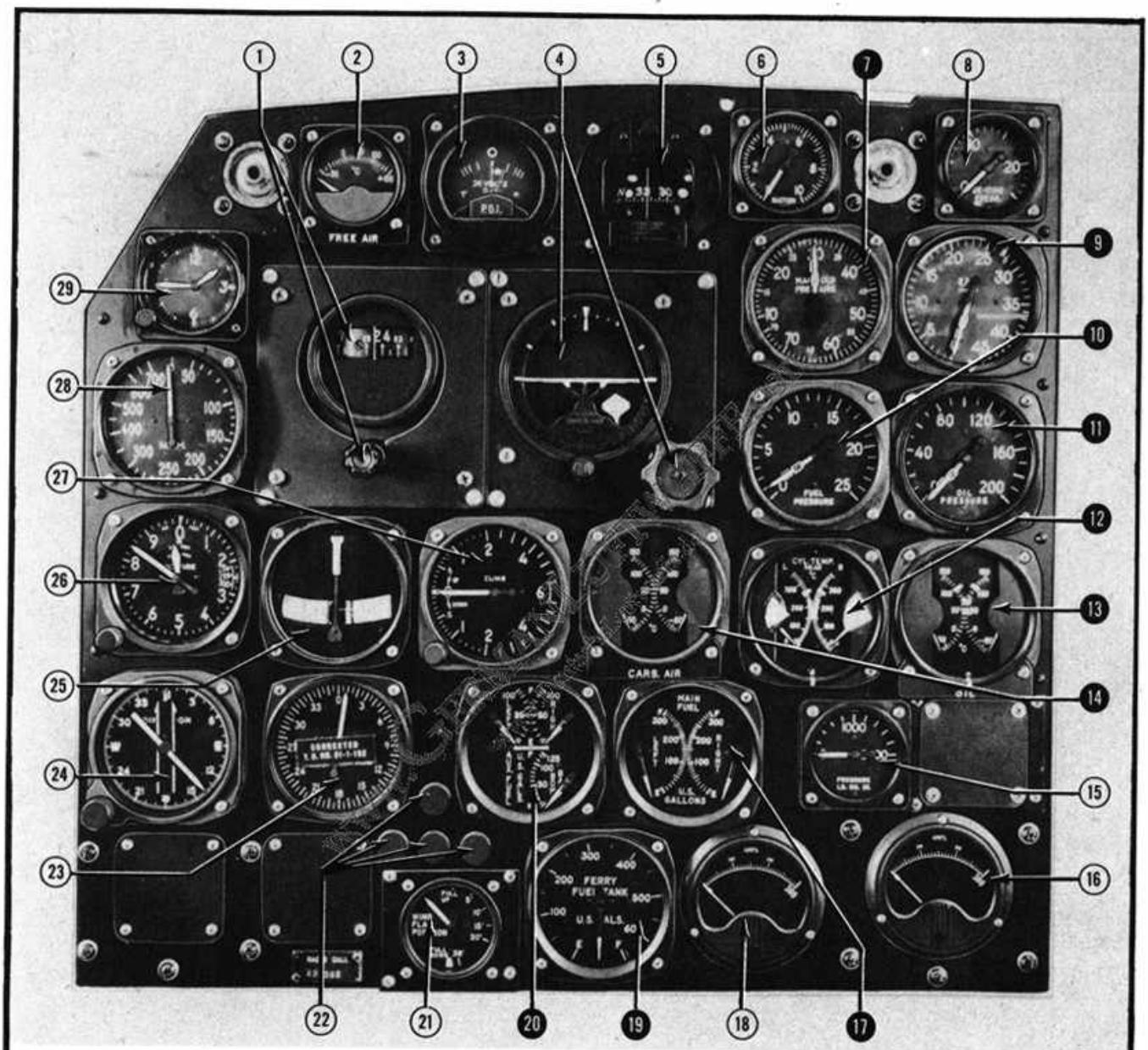
Figure 19 (Sheet 1 of 3)—Instrument Panel



1. Directional Gyro (Turn) Indicator and Setting Knob
2. Outside (Free) Air Indicator
3. Radio Compass Left-Right Indicator
4. Gyro Horizon (Flight) Indicator and Caging Knob
5. Remote Magnetic Compass Indicator
6. Manifold Pressure Gage (Dual)
7. Suction Gage
8. De-Icer System Pressure Gage
9. Tachometer Indicator (Dual)
10. Fuel Pressure Gage
11. Oil Pressure Indicator (Dual)
12. Carburetor Air Temperature Indicator (Dual)
13. Oil Temperature Indicator (Dual)
14. Cylinder Head Temperature Indicator (Dual)
15. Oil Cooler Door Position Indicator (Dual)
16. Voltmeter
17. Hydraulic Pressure Gage
18. R.H. Engine Ammeter
19. Main Fuel Quantity Gage
20. L.H. Engine Ammeter
21. Auxiliary Fuel Quantity Gage
22. Landing Gear and Wing Flap Indicator
23. Landing Gear Warning Lamps
24. Rate of Climb Indicator
25. Bank and Turn Indicator
26. Tell-Tale Indicator
27. Altimeter
28. Airspeed Indicator
29. Clock

(ON INTERMEDIATE AIRPLANES)

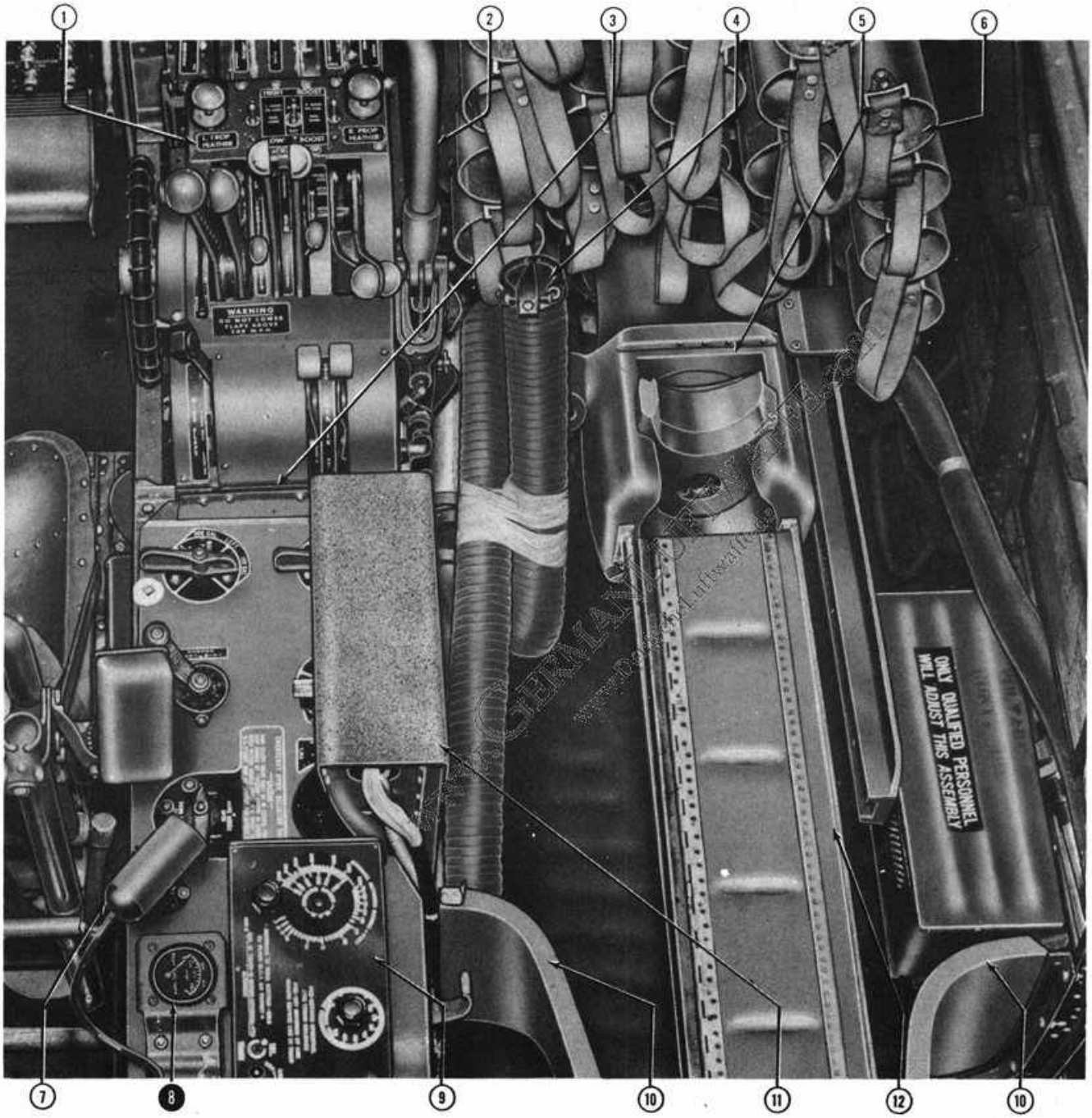
Figure 19 (Sheet 2 of 3)—Instrument Panel



1. Directional Gyro (Turn) Indicator and Setting Knob
2. Outside (Free) Air Indicator
3. Pilot's Directional Indicator
4. Gyro Horizon (Flight) Indicator and Caging Knob
5. Magnetic Compass
6. Suction Gage
7. Manifold Pressure Gage (Dual)
8. De-Icer System Pressure Gage
9. Tachometer Indicator (Dual)
10. Fuel Pressure Gage (Dual)
11. Oil Pressure Indicator (Dual)
12. Cylinder Head Temperature Indicator (Dual)
13. Oil Temperature Indicator (Dual)
14. Carburetor Air Temperature Indicator (Dual)
15. Hydraulic Pressure Gage
16. R.H. Engine Ammeter
17. Main Fuel Quantity Gage
18. L.H. Engine Ammeter
19. Ferry Fuel Indicator
20. Auxiliary Fuel Quantity Gage
21. Wing Flap Indicator
22. Landing Gear Warning Lamps
23. Radio Compass Quadrantal Error Correction Indicator
24. Remote Magnetic Compass Indicator
25. Bank and Turn Indicator
26. Altimeter
27. Rate of Climb Indicator
28. Airspeed Indicator
29. Clock

(ON LATE AIRPLANES)

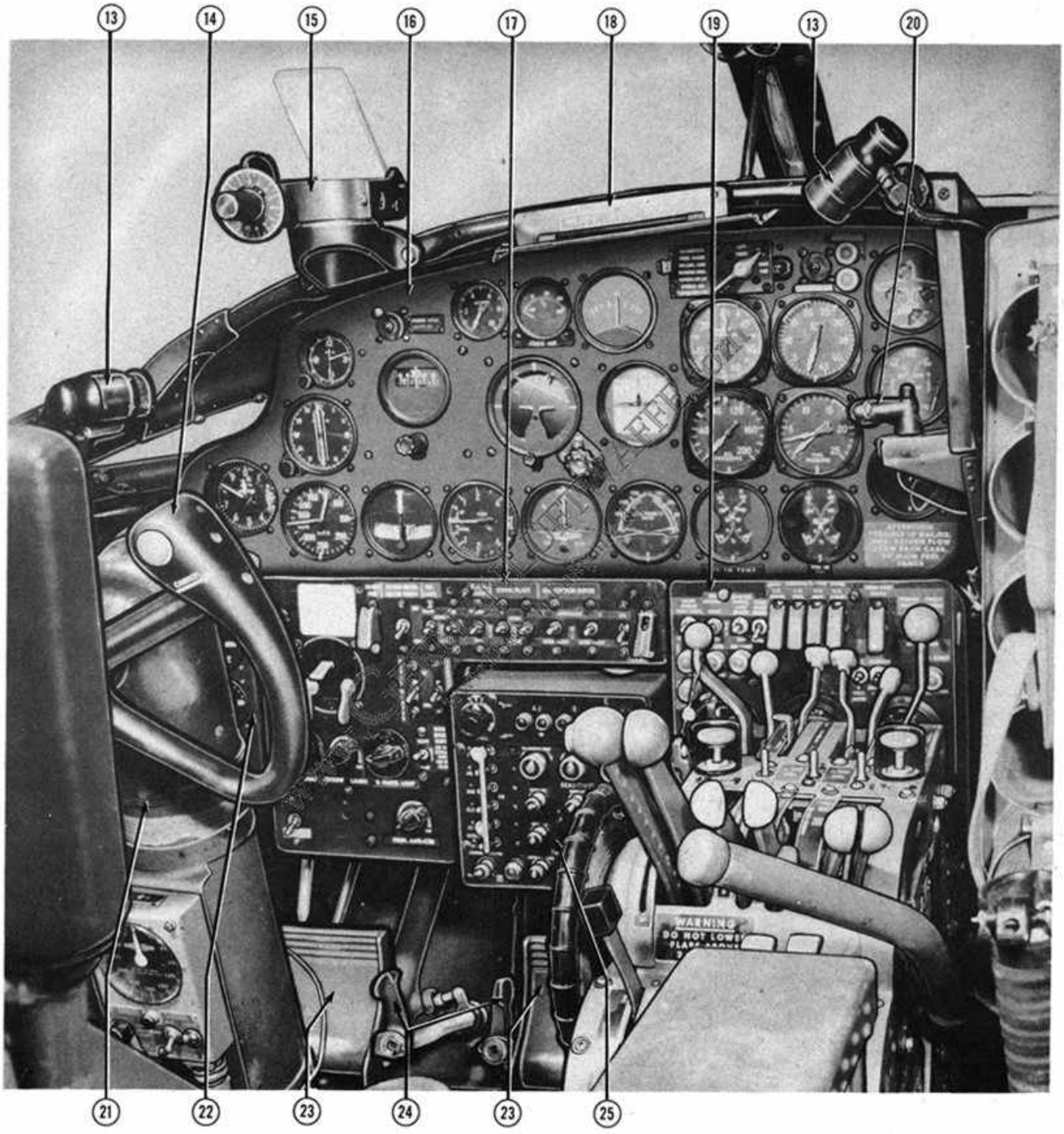
Figure 19 (Sheet 3 of 3)—Instrument Panel



★ VIEW FROM TOP

1. Control Pedestal — Forward Section
2. Hydraulic Hand Pump Handle
3. Control Pedestal — Center Section
4. Air Outlet (Hot or Cold)
5. 75 mm Cannon Breach
6. 75 mm Cannon Shell Stowage Rack
7. Extension Light
8. Ferry Fuel Tank Quantity Gage
9. Bombing Intervalometer
10. Gun Loader's Leg Guards (2 Places)
11. Foot Step (Covers Radio Compass Remote Control Box)
12. Cannon Shell Case Ejector Chute

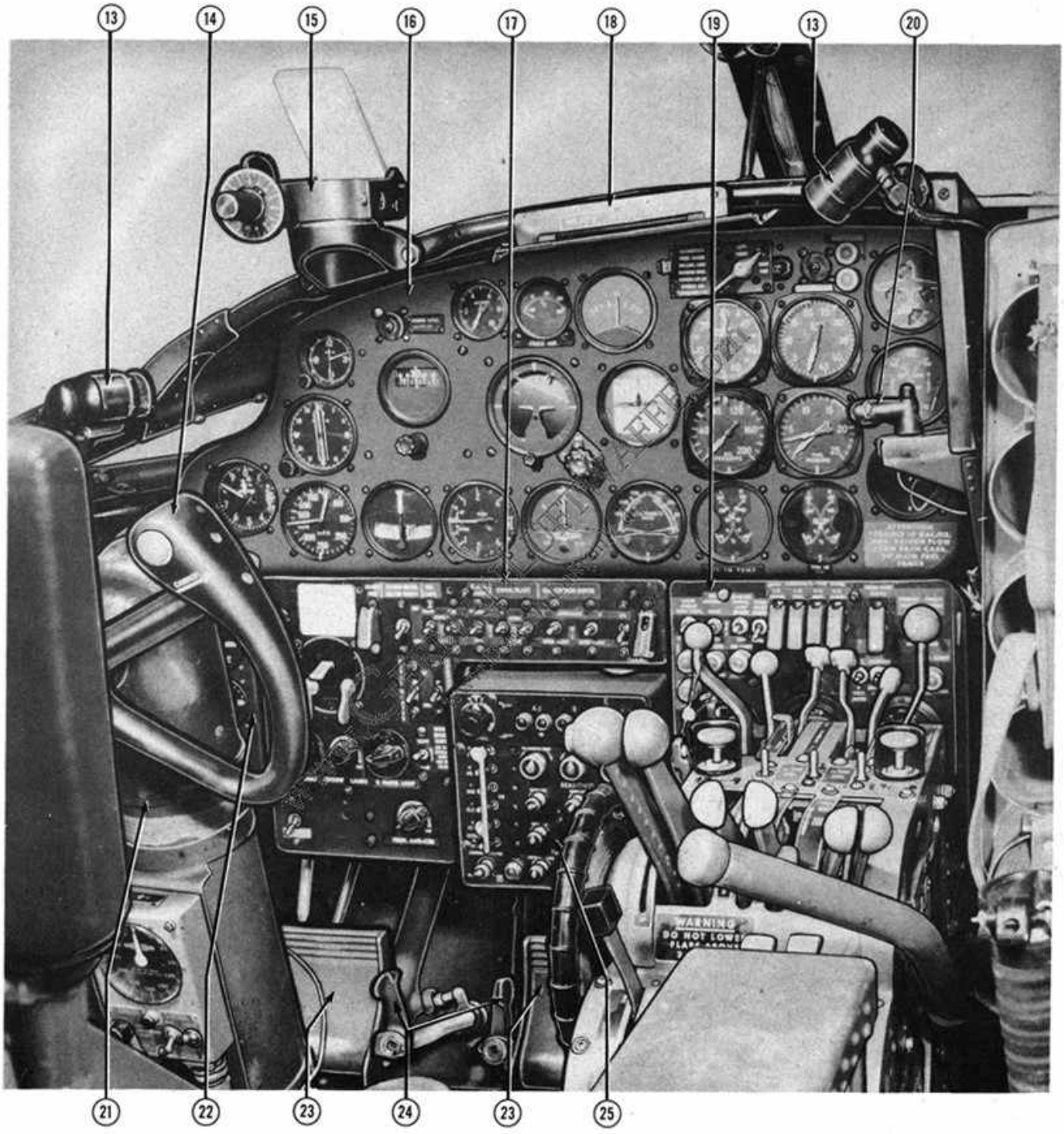
Figure 20 (Sheet 1 of 6)—Pilot's Compartment (on Early Airplanes)



★ VIEW LOOKING FORWARD

13. Instrument Panel Fluorescent Light (Two Places)
14. Control Wheel
15. Gun Sight Head
16. Instrument Panel
17. Main Electrical Control Panel
18. Pilot's Instruction Placard
19. Auxiliary Electrical Control Panel
20. Instrument Panel Non-Fluorescent Light
21. Control Column
22. Auxiliary Instrument Panel
23. Rudder (Brake) Pedal (Two Places)
24. Rudder Pedal Adjustment Levers
25. A.F.C.E. Control Box

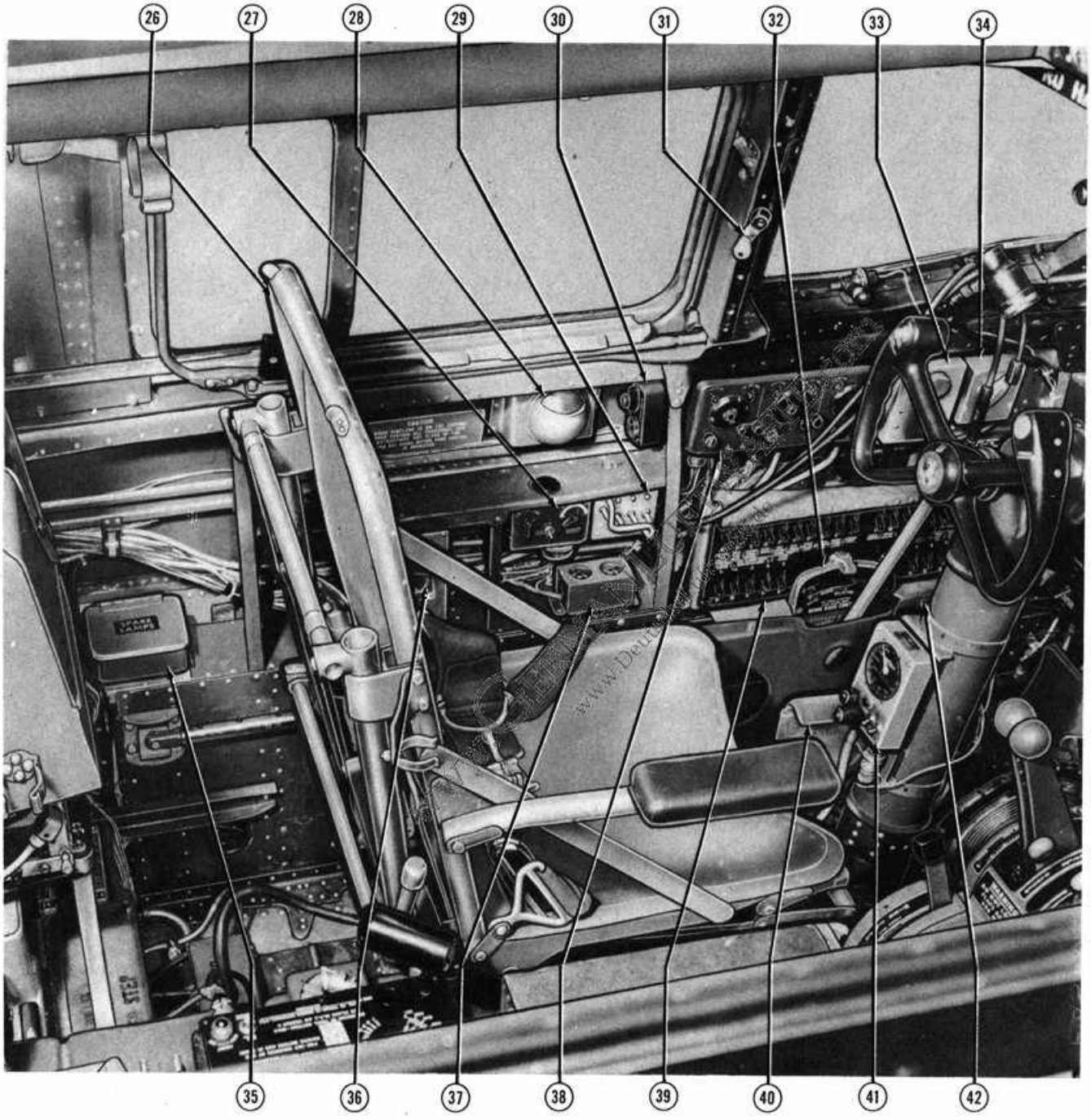
Figure 20 (Sheet 2 of 6)—Pilot's Compartment (on Early Airplanes)



★ VIEW LOOKING FORWARD

13. Instrument Panel Fluorescent Light (Two Places)
14. Control Wheel
15. Gun Sight Head
16. Instrument Panel
17. Main Electrical Control Panel
18. Pilot's Instruction Placard
19. Auxiliary Electrical Control Panel
20. Instrument Panel Non-Fluorescent Light
21. Control Column
22. Auxiliary Instrument Panel
23. Rudder (Brake) Pedal (Two Places)
24. Rudder Pedal Adjustment Levers
25. A.F.C.E. Control Box

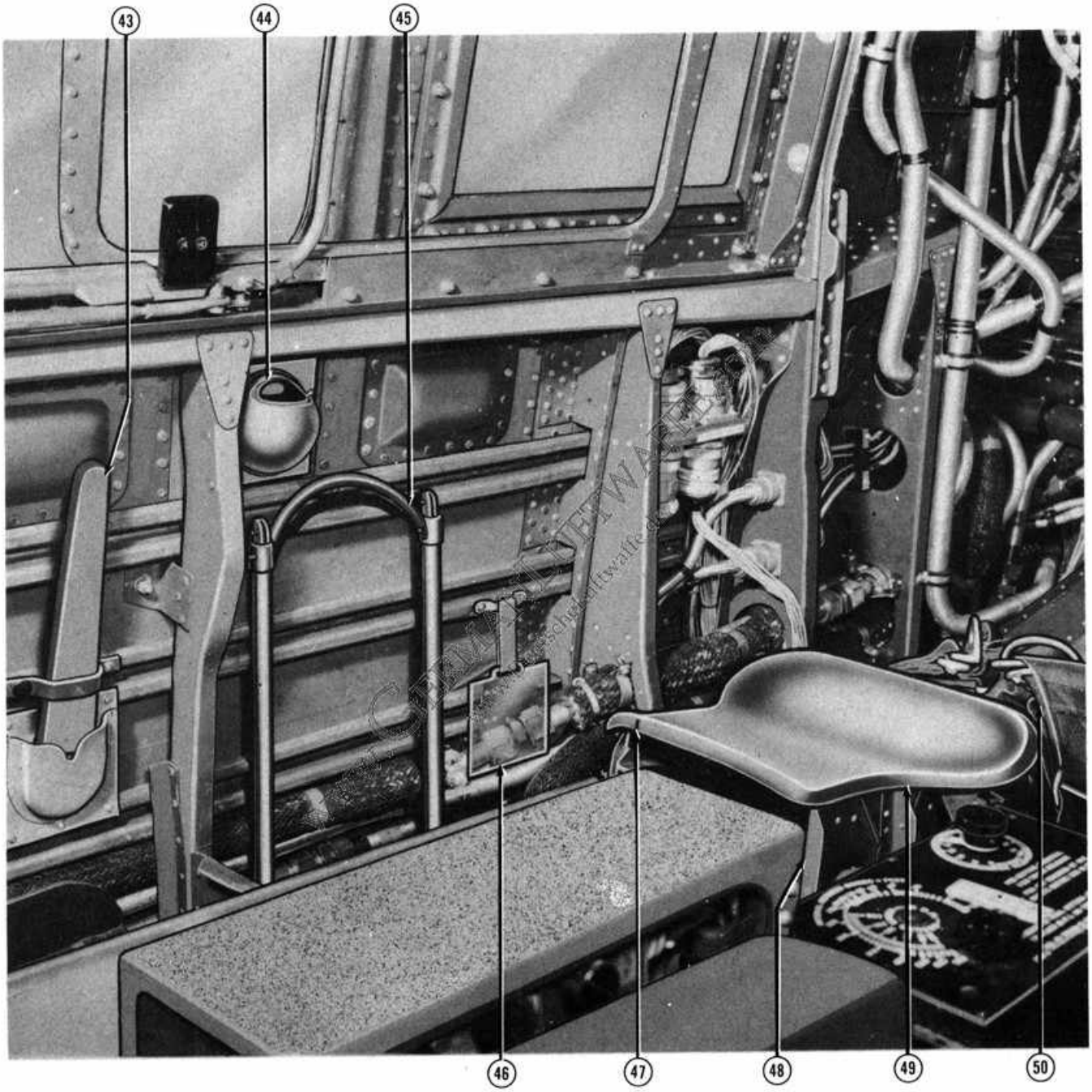
Figure 20 (Sheet 2 of 6)—Pilot's Compartment (on Early Airplanes)



VIEW OF LEFT HAND SIDE ★

26. Pilot's Seat
27. Transmitter Control Box, BC-451-A
28. Ash Tray
29. Recognition Lights Control Box
30. Pilot's Inter-Call Signal Box
31. L. H. Window Friction Release Crank
32. Bomb Rack Control
33. Pilot's Interphone Jack Box
34. Filter Switch Box
35. Spare Lamp Box
36. Suit Heat Rheostat
37. Destroyer Switch Box
38. Receiver Control Box, BC-450-A
39. Pilot's Electrical Distribution Panel
40. Spare Filter Container for Interaircraft Signal Lamp
41. Radio Compass Azimuth Control
42. Parking Brake Control—(Hidden)

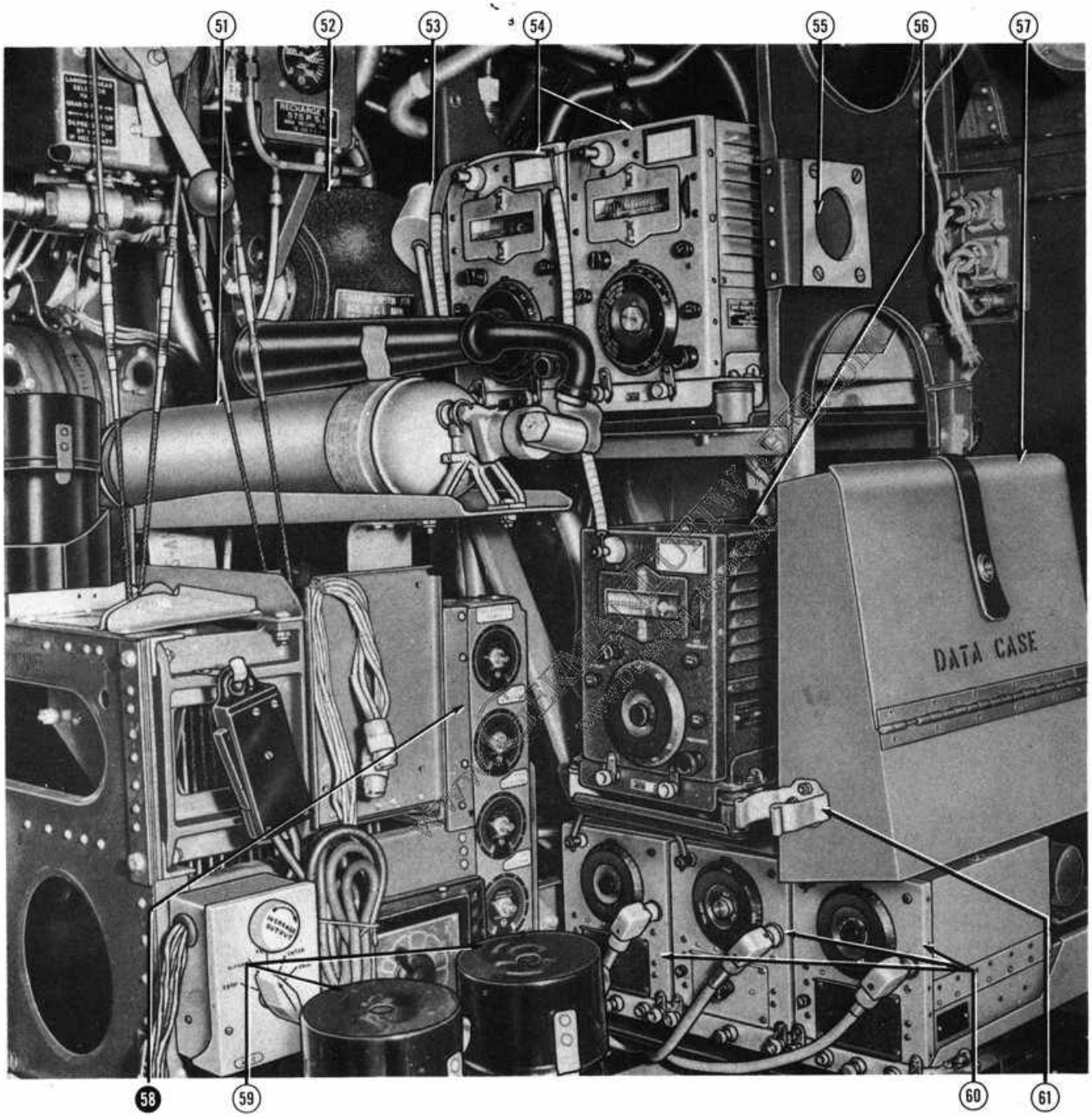
Figure 20 (Sheet 3 of 6)—Pilot's Compartment (on Early Airplanes)



VIEW OF RIGHT HAND SIDE ★

43. 75 mm Cannon Fuse Setting Wrench
44. Ash Tray
45. Pilot's Compartment Extension Access Ladder
46. Pilot's Check List Holder
47. Pilot's Compartment Bomb Bay Door Retaining Slot.
48. First Aid Kit
49. Gun Loader's Seat
50. Safety Belt

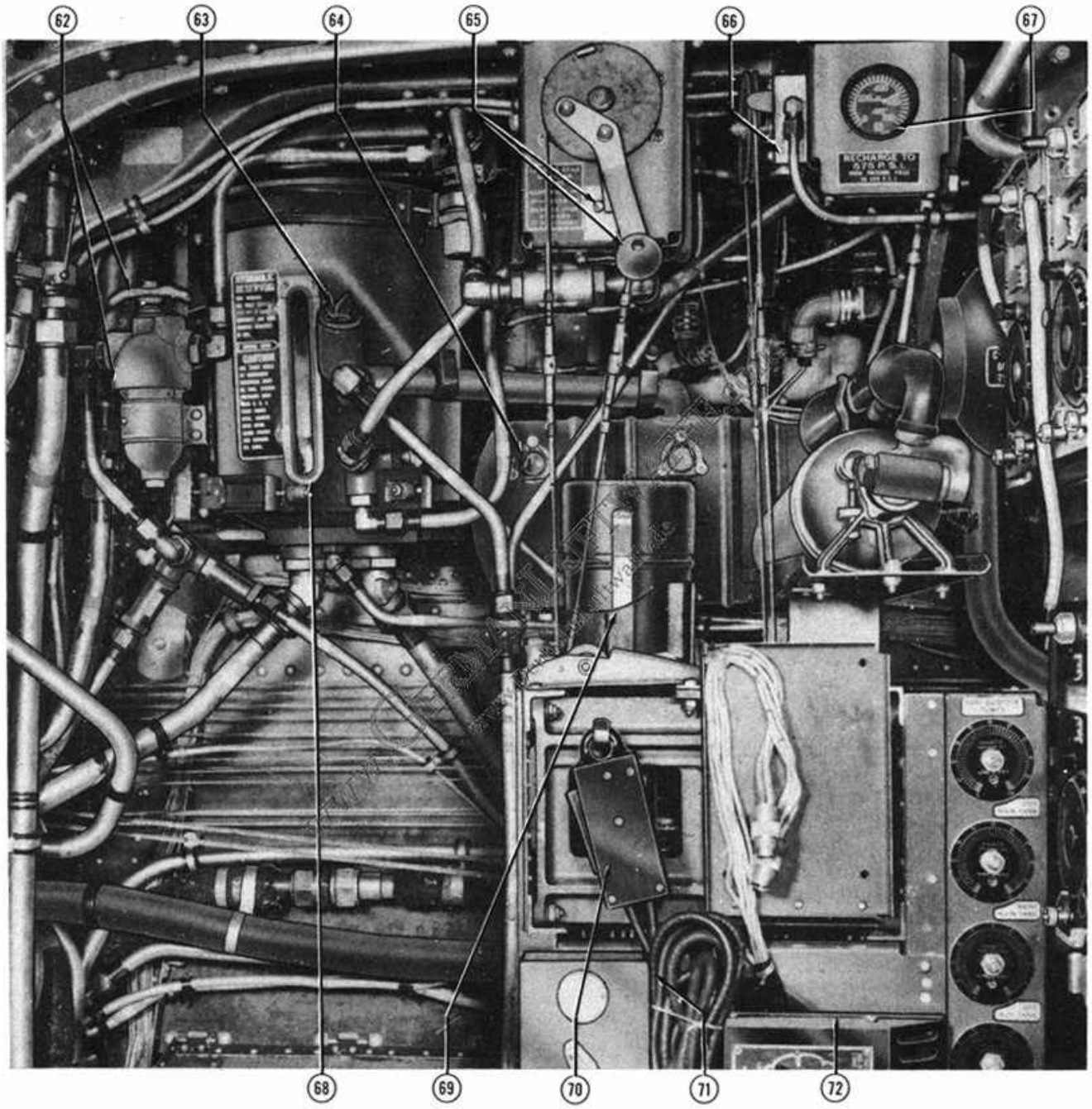
Figure 20 (Sheet 4 of 6)—Pilot's Compartment (on Early Airplanes)



AFT VIEW (LEFT HAND SIDE) ★

51. Carbon Dioxide Fire Extinguisher
52. Hydraulic System Pressure Accumulator
53. Hydraulic Reservoir Filler Funnel
54. SCR-274-N Transmitters, BC-457-A and BC-458-A
55. Orientation Camera Mount
56. SCR-274-N Transmitter, BC-696-A
57. Data Case and Glove Compartment
58. Fuel Booster Pumps Rheostat Panel
59. Relief Containers
60. SCR-274-N Receivers, BC-454-A, BC-453-A and BC-455-A
61. Load Adjuster Stowage Bracket

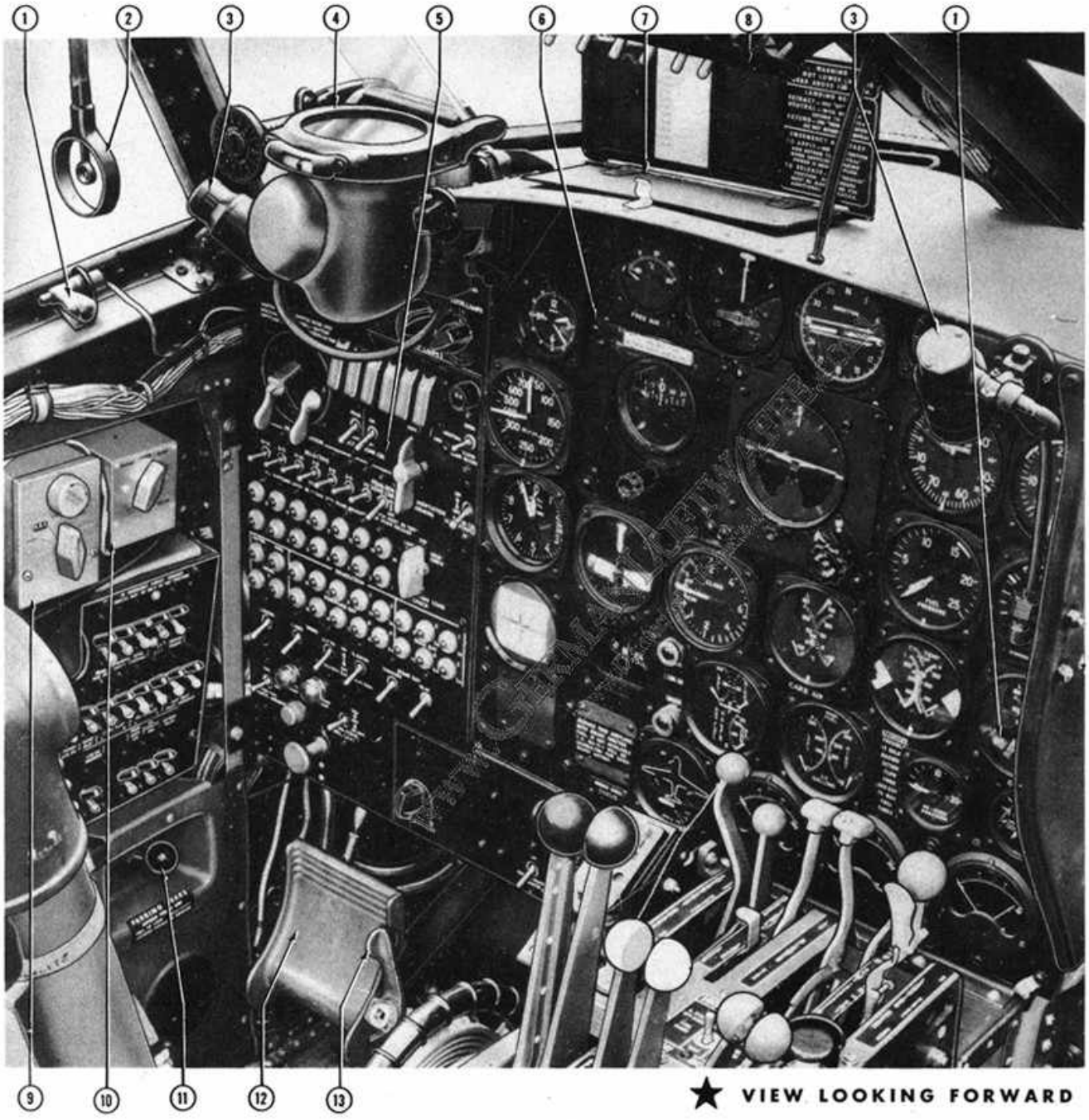
Figure 20 (Sheet 5 of 6)—Pilot's Compartment (on Early Airplanes)



AFT VIEW (RIGHT HAND SIDE) ★

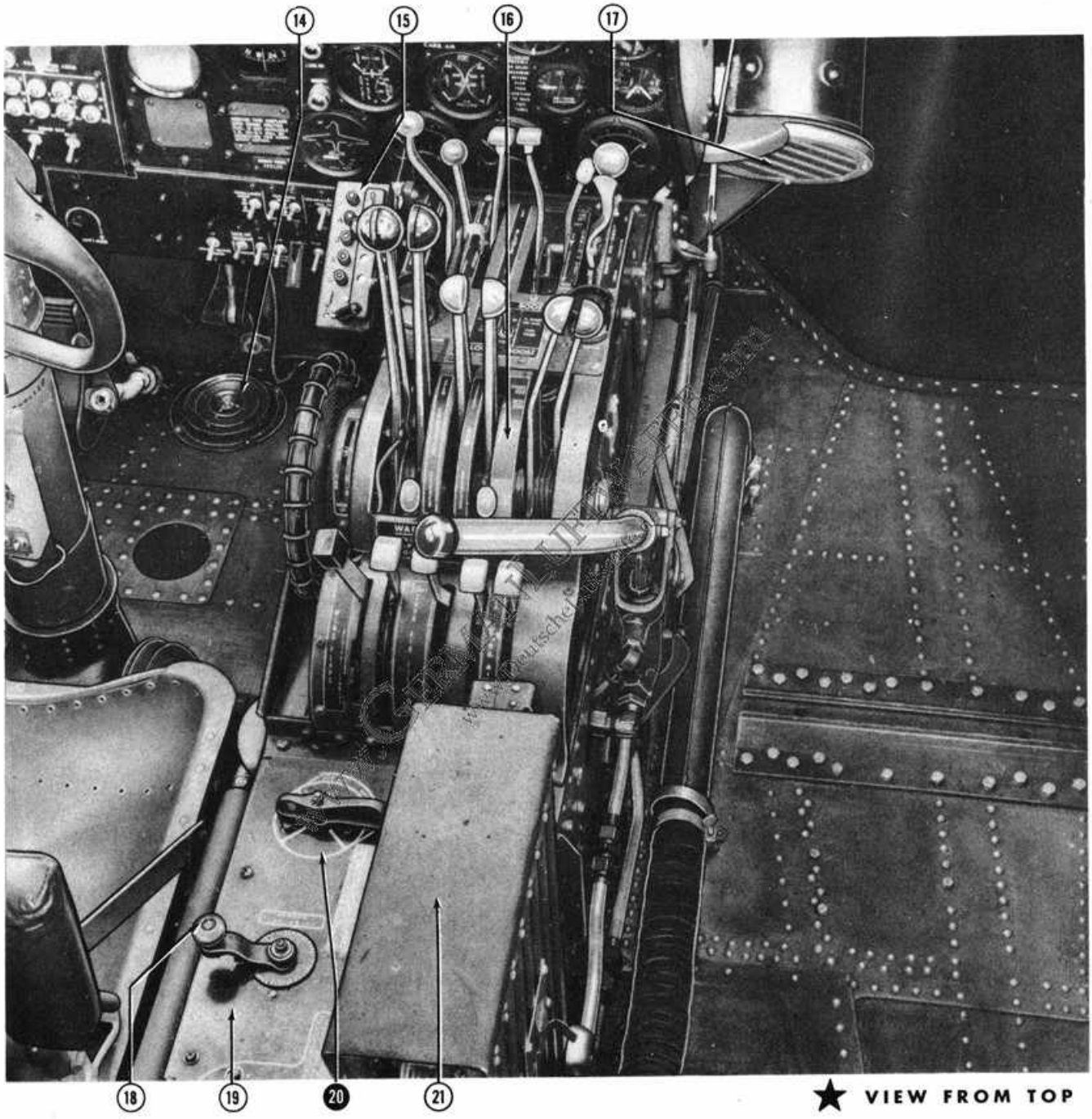
62. Hydraulic Filter and Filter Handle
63. Hydraulic Reservoir Filler Neck
64. Emergency Hydraulic Reservoir Fluid Level Inspection Windows
65. Auxiliary Landing Gear Control and Solenoid Pin
66. Emergency Air Brake Selector Valve
67. Emergency Air Brake System Pressure Gage
68. Hydraulic Reservoir Sight Gage
69. Relief Container Stowage Bracket
70. Microphone Switch
71. Gun Loader's Interphone Jack Box
72. Gun Loader's Suit Heat Rheostat

Figure 20 (Sheet 6 of 6)—Pilot's Compartment (on Early Airplanes)



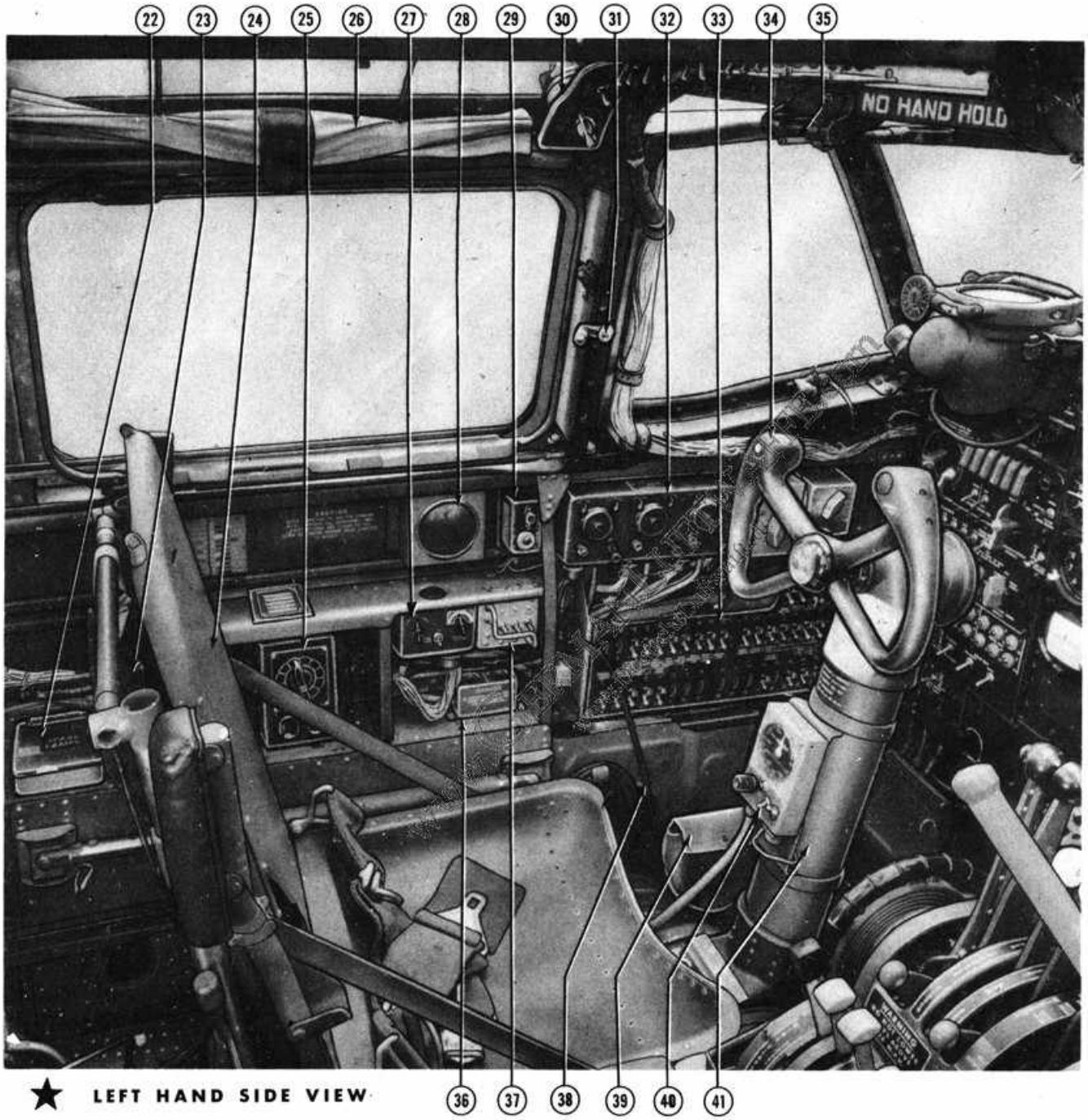
1. Cockpit Type Lamp (2 Places)
2. Ring and Bead Sight
3. Fluorescent Lamps (2).
4. Gun and Bomb Sight Head
5. Main Electrical Control Panel
6. Instrument Panel
7. Compass and Altimeter Correction Card Holder
8. Pilot's Fire Control Panel
9. Pilot's Interphone Jack Box
10. Filter Switch Box
11. Parking Brake Control
12. Rudder (Brake) Pedals
13. Rudder Pedal Adjustment Levers

Figure 21 (Sheet 1 of 6)—Pilot's Compartment (on Intermediate Airplanes)



14. Pilot's Footwarmer
15. SCR-522-A Command Set Control Box
16. Control Pedestal — Forward Section
17. Heat and Vent Re-circulating Heater
18. Rudder Trim Tab Control
19. Control Pedestal — Center Section
20. L. H. Tanks Selector Valve
21. Footstep

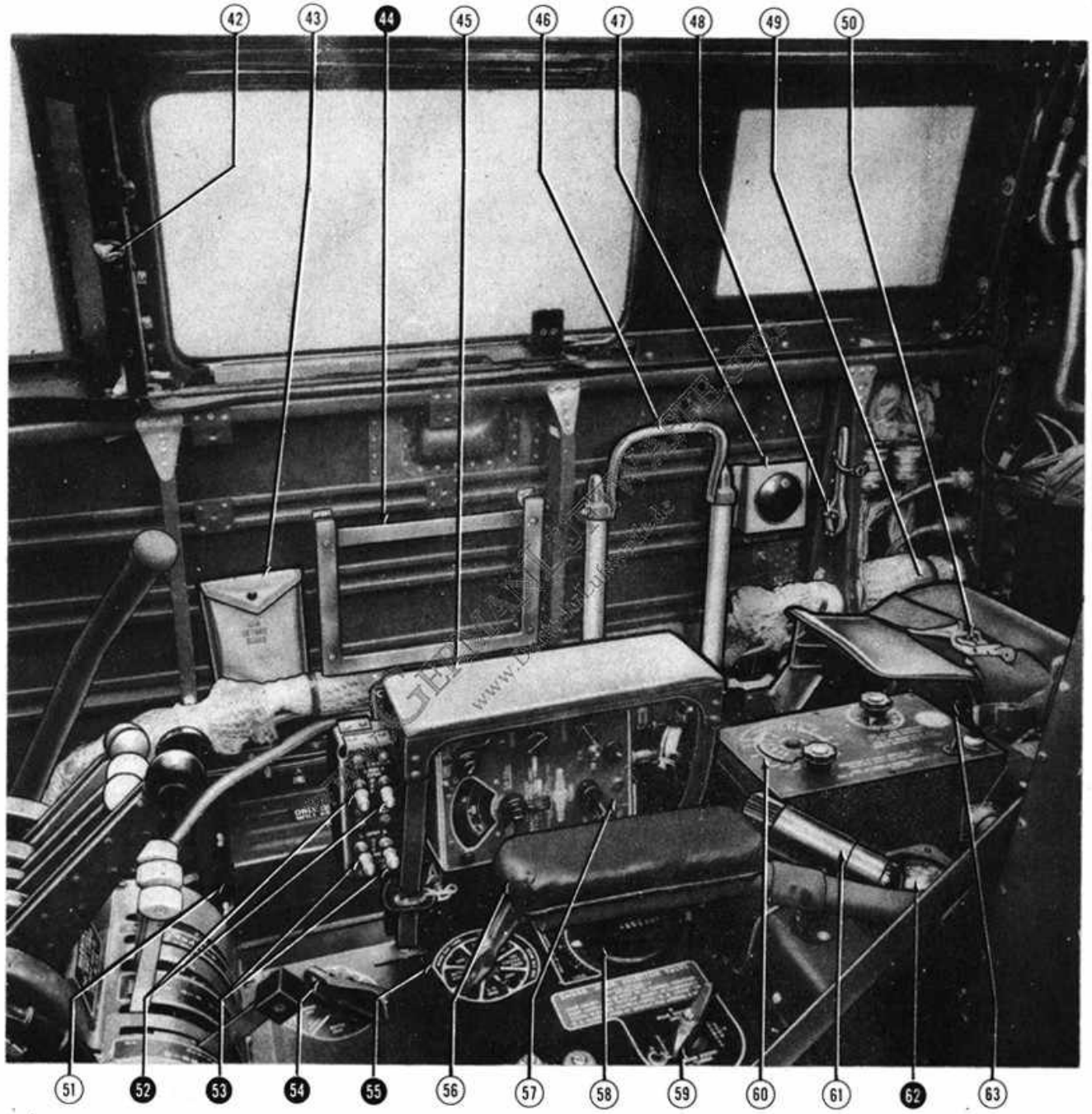
Figure 21 (Sheet 2 of 6)—Pilot's Compartment (on Intermediate Airplanes)



★ LEFT HAND SIDE VIEW

22. Spare Lamp Box
23. Pilot's Check-Off List
24. Pilot's Seat and Safety Belt
25. Suit Heat Rheostat
26. Pull Curtain
27. Transmitter Control Box, BC-451-A
28. Ash Tray
29. Pilot's Intercall Signal Box
30. Overhead Electrical Control Panel
31. L. H. Window Friction Release Crank
32. Receiver Control Box, BC-450-A
33. Pilot's Electrical Distribution Panel
34. Pilot's Control Wheel
35. Torpedo Director Bracket
36. Destroyer Switch Box
37. Recognition Lights Control Box
38. Microphone Plug-In Cord
39. Spare Filter Container for Intercraft Signal Lamp
40. Radio Compass Azimuth Control
41. Control Column

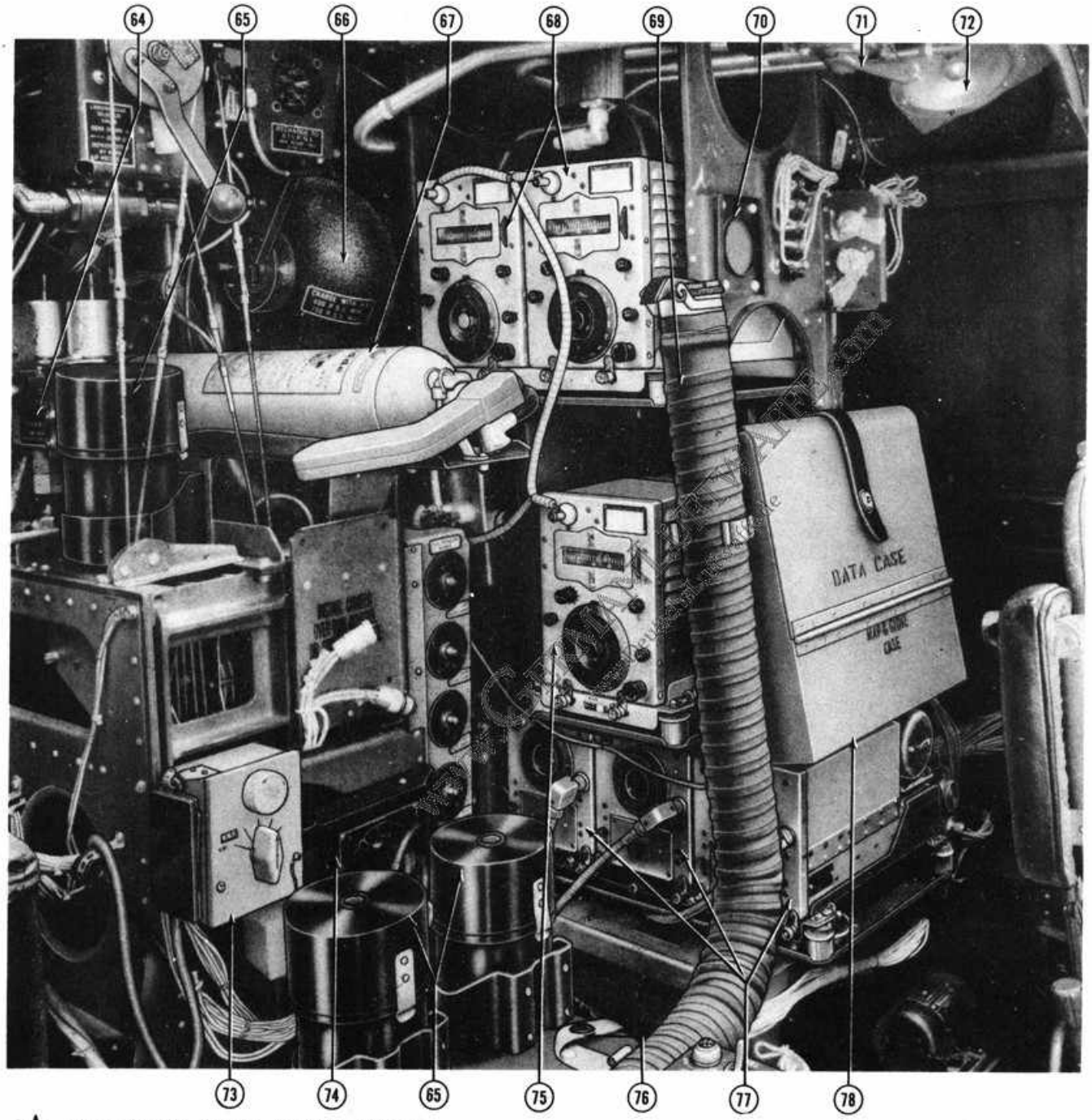
Figure 21 (Sheet 3 of 6)—Pilot's Compartment (on Intermediate Airplanes)



★ **RIGHT HAND SIDE VIEW**

42. R. H. Window Friction Release Crank
43. Gun Record Books
44. Fuel Diagram Holder
45. Footstep
46. Pilot's Compartment Extension Access Ladder
47. Ash Tray
48. 75 mm Cannon Fuse Setting Wrench
49. Gun Loader's Seat
50. Safety Belt
51. Voltage Regulator
52. Oil Cooler Door Switches
53. Cowl Flap Switches
54. R. H. Tanks Selector Valve
55. Bomb Bay Tank Selector Valve
56. Pilot's Arm Rest
57. Radio Compass Remote Control Box
58. Aileron Trim Tab Control
59. Emergency Hydraulic Selector Valve
60. Intervalometer
61. Extension Lamp
62. Long Range Fuel Tank Gage
63. First Aid Kit Stowage

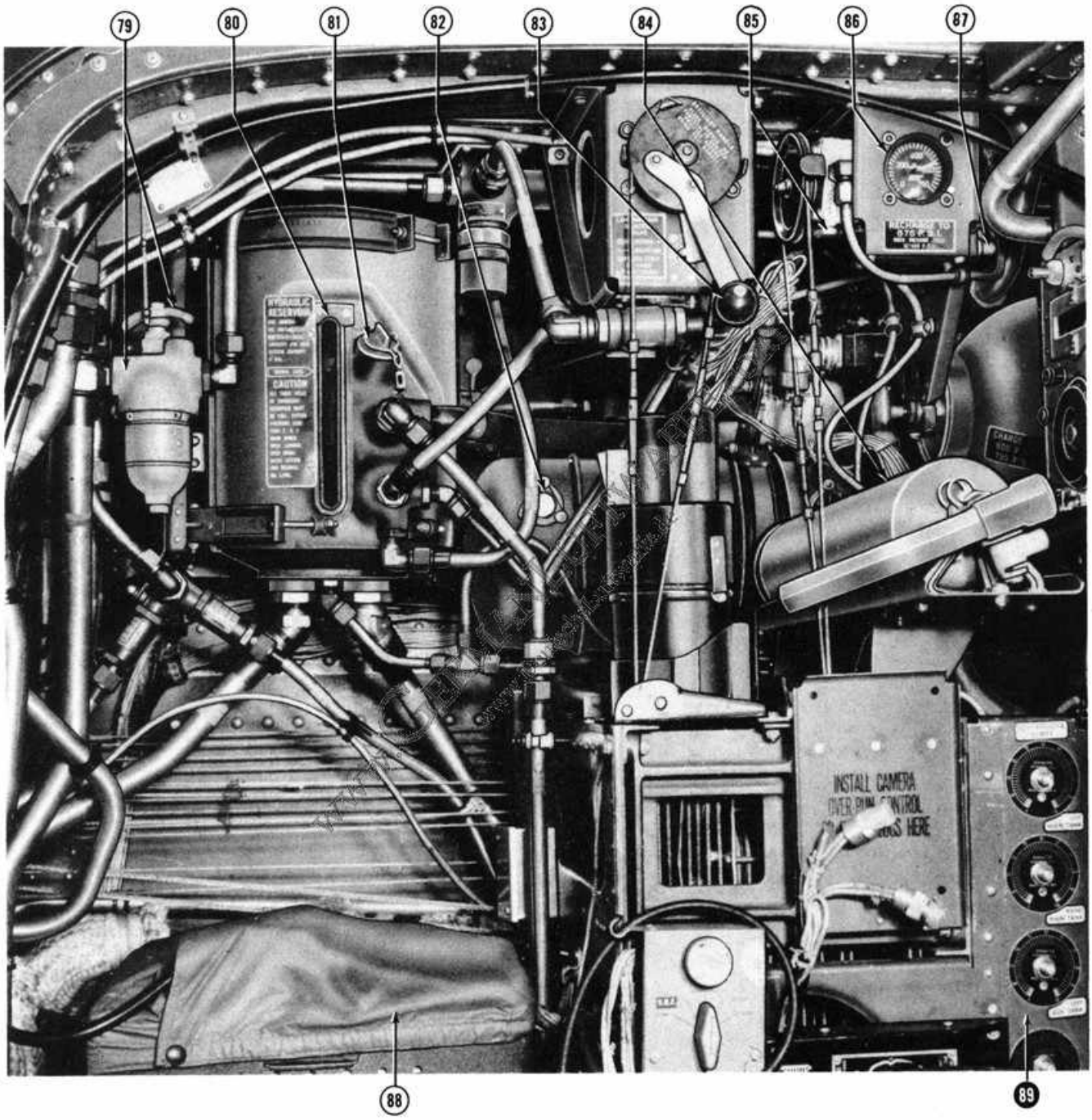
Figure 21 (Sheet 4 of 6)—Pilot's Compartment (on Intermediate Airplanes)



★ **AFT VIEW (LEFT HAND SIDE)**

64. Emergency Bomb Door Manual Control
65. Relief Containers (2 places)
66. Hydraulic Pressure Accumulator
67. Carbon Dioxide Fire Extinguisher
68. SCR-274-N Transmitters, BC-457-A and BC-458-A
69. Flexible Defroster and Hand Warmer
70. Orientation Camera Mount
71. Instrument Vacuum Selector Valve
72. Dome Lamp
73. Interphone Jack Box and Microphone Switch
74. Gun Loader's Suit Heat Rheostat
75. SCR-274-N Transmitter, BC-696-A
76. Pyrotechnic Pistol and Signal Flare Stowage
77. SCR-274-N Receivers, BC-454-A, BC-453-A, and BC-455-A
78. Data Case and Glove Compartment

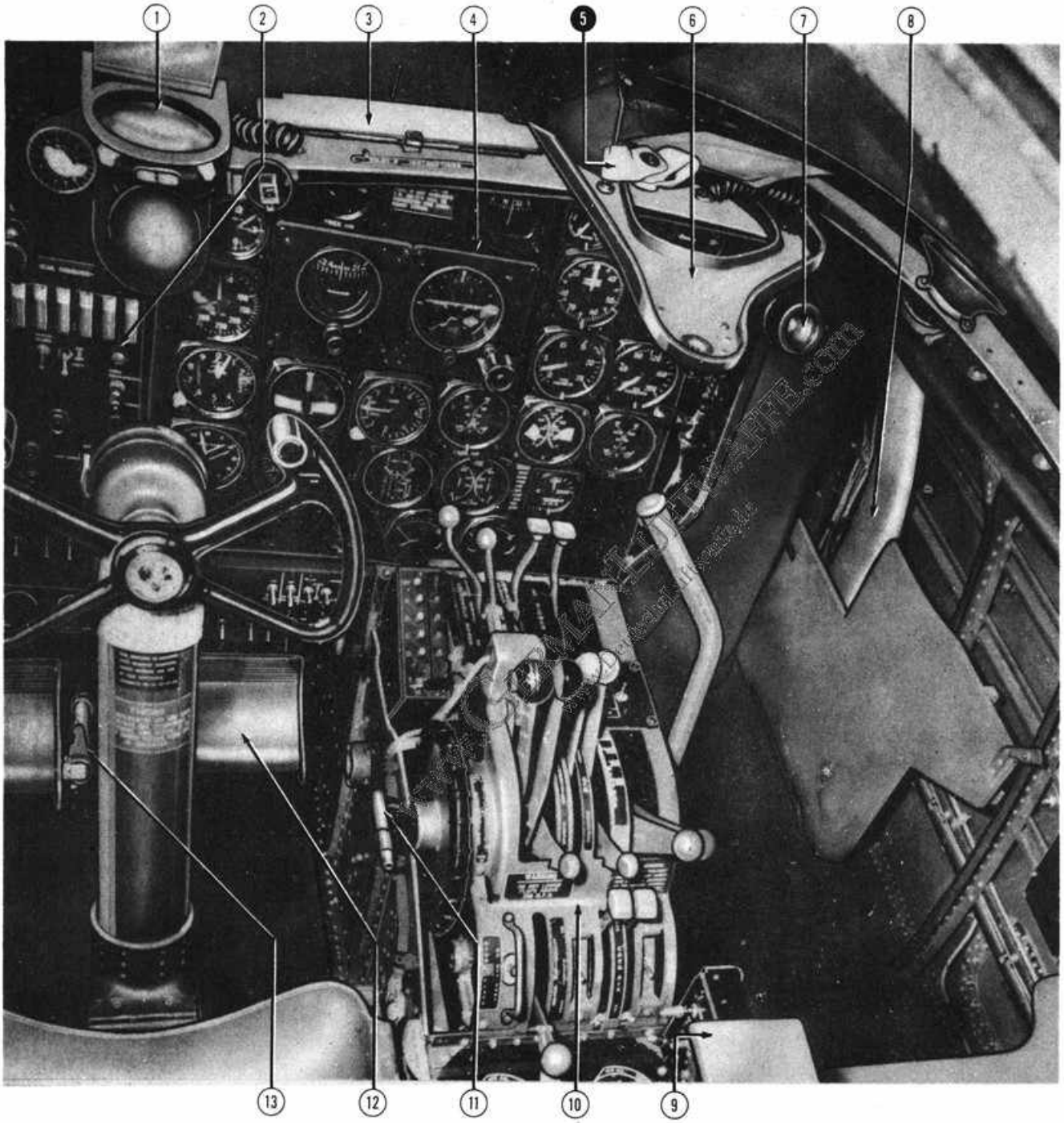
Figure 21 (Sheet 5 of 6)—Pilot's Compartment (on Intermediate Airplanes)



★ AFT VIEW (RIGHT HAND SIDE)

79. Hydraulic Filter and Filter Handle
80. Hydraulic Reservoir Sight Gage
81. Hydraulic Reservoir Filler Neck
82. Emergency Hydraulic Reservoir Fluid
83. Auxiliary Landing Gear Control and Solenoid
84. Carbon Dioxide Fire Extinguisher
85. Emergency Air Brake Selector Valve
86. Emergency Air Brake System Pressure Gage
87. Emergency Air Brake Bottle Filler Valve
88. SCR-522 Command Radio Set Transmitter
89. Fuel Booster Pumps Rheostat Panel

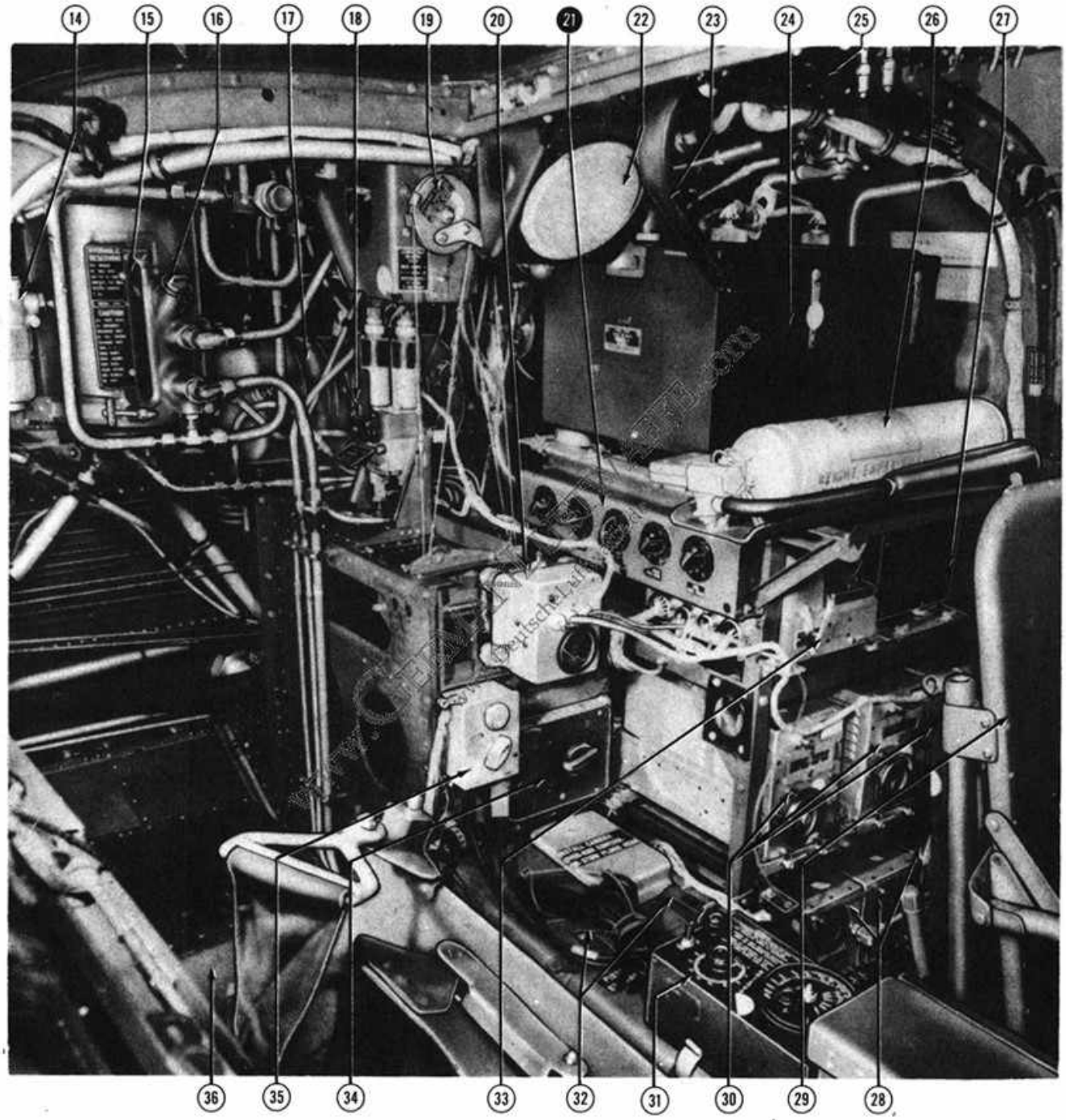
Figure 21 (Sheet 6 of 6)—Pilot's Compartment (on Intermediate Airplanes)



★ VIEW LOOKING FORWARD

1. Bomb and Gun Sight Head
2. Main Electrical Distribution Panel
3. Pilot's Instruction Placard
4. Instrument Panel
5. Pilot's Check List
6. Bullet-proof Sheet Support
7. Adjustable Lamp
8. Heat and Vent Duct
9. Footstep
10. Control Pedestal
11. Emergency Nose Wheel Release
12. Rudder (Brake) Pedal
13. Rudder Pedal Adjustment Lever

Figure 22 (Sheet 1 of 4)—Pilot's Compartment (On Late Airplanes)



★ VIEW LOOKING AFT

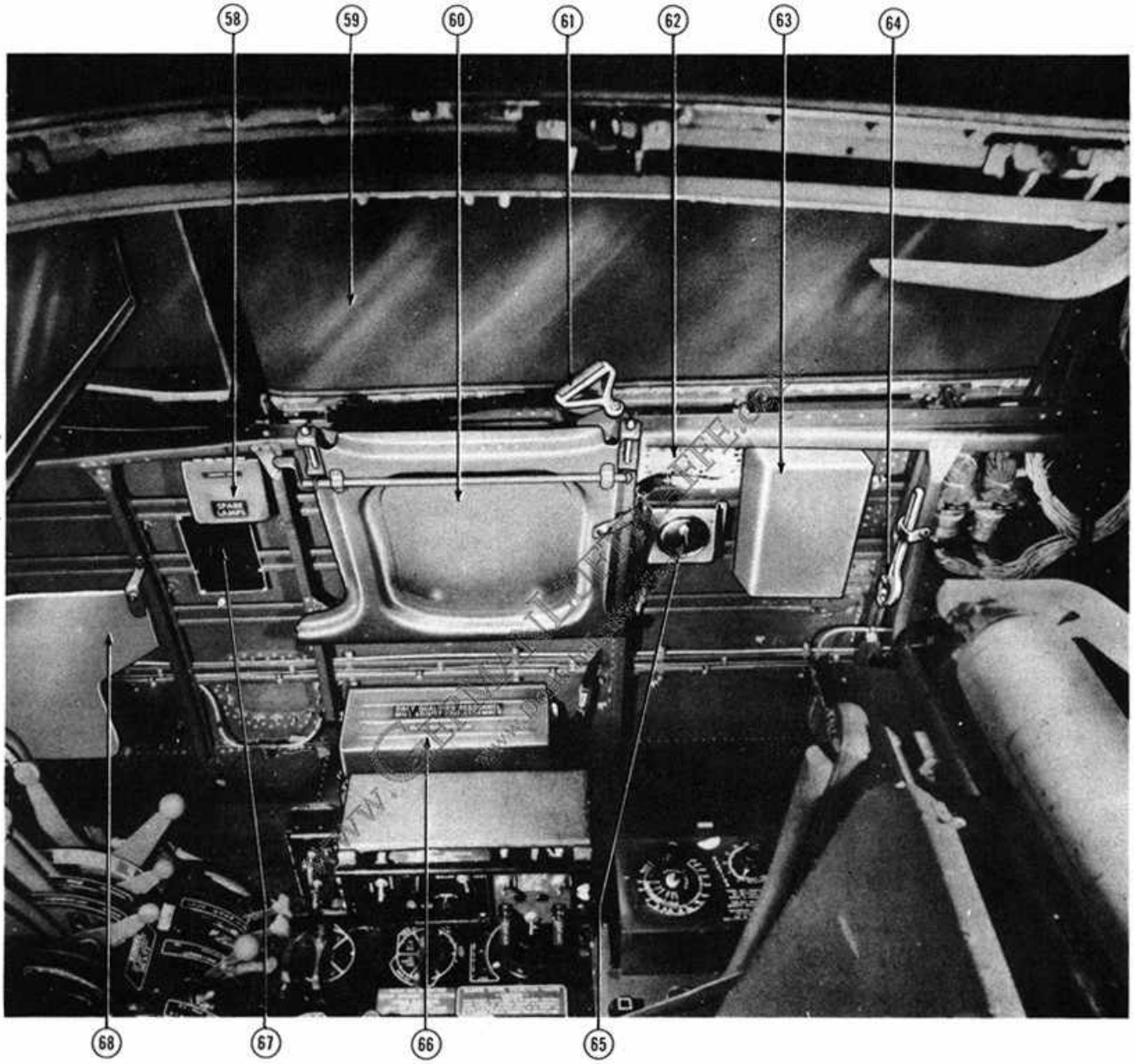
14. Hydraulic Filter
15. Hydraulic Reservoir Sight Gage
16. Hydraulic Reservoir Filler Neck
17. Emergency Hydraulic Reservoir Fluid
18. Emergency Bomb Door Manual Control
19. Auxiliary Landing Gear Control and Solenoid
20. SCR-274-N Antenna Switching Relay Unit
21. Fuel Booster Pumps Rheostat Panel
22. Dome Lamp
23. Enclosure Release Handle
24. SCR-522 Radio
25. Overhead Switch Panel
26. Carbon Dioxide Fire Extinguisher
27. SCR-522 Radio Dynamotor
28. SCR-274-N Receiver (3)
29. Pilot's Seat
30. SCR-274-N Transmitter (3)
31. Intervalometer
32. Pyrotechnic Pistol and Signal Flare Stowage
33. SCR-274-N Transmitter Modulator
34. Gun Loader's Suit Heat Rheostat
35. Interphone Jack Box and Microphone Switch
36. Cannon Loader's Seat

Figure 22 (Sheet 2 of 4)—Pilot's Compartment (On Late Airplanes)

★ VIEW OF LEFT HAND SIDE

37. Clamshell Type Enclosure
38. SCR-274-N Receiver Remote Control Unit
39. Pilot's Interphone Jack Box
40. Cockpit Lamp
41. Pilot's Radio Range Filter
42. Gun Sight and Torpedo Directional Lamp
43. Radio Switch Panel
44. Main Electrical Distribution Panel
45. Control Column
46. Parking Brake Control
47. Auxiliary Electrical Distribution Panel
48. Signal Lamp Filters' Bag
49. Microphone Plug-in Cord
50. Intercall Signal Light Control Box
51. Recognition Light Control Box
52. Radio Compass Remote Control Unit
53. Destroyer Switch Box
54. Radio Compass Card Holder
55. Static Pressure Selector Switch
56. SCR-274-N Transmitter Remote Control Unit
57. Magnetic Compass Card Holder

Figure 22 (Sheet 3 of 4)—Pilot's Compartment (On Late Airplanes)



★ VIEW OF RIGHT HAND SIDE

58. Spare Lamps Box
59. Clam Shell Type Enclosure
60. Navigator's Seat
61. Navigator's Safety Belt
62. Lines Color Code Decal
63. Driftmeter Stowage Kit
64. 75MM Cannon Fuse Setting Wrench
65. Ash Tray
66. Voltage Regulator
67. Radio Compass AN ARN-7 Operating Instruction Card
68. Navigator's Table Stowage

Figure 22 (Sheet 4 of 4)—Pilot's Compartment (On Late Airplanes)

SECTION II
NORMAL OPERATING INSTRUCTIONS

1. FLIGHT RESTRICTIONS.

a. MANEUVERS PROHIBITED.

(1) Loops.

(2) Spins.

(3) Rolls.

(4) Inverted Flight.

b. AIRSPEED LIMITATIONS.

(1) Level Flight.....No Restrictions

(2) Extending Wing Flaps.....208 mph

(3) Extending Landing Gear.....160 mph

(4) Extending Landing Lights.....190 mph

(5) Opening Bomb Bay Doors (with spoilers).....425 mph

(6) De-icer Boots Installed (level flight)*

(a) Operative.....300 mph

(b) Inoperative.....350 mph

(7) Diving.....425 mph

CAUTION

*It is recommended that a lower limiting speed be used than that given above when the de-icer boots are installed. The above speeds are subject to further test.

Note

These limitations may be supplemented or superseded by instructions included in Service publications.

2. BEFORE ENTERING PILOT'S COMPARTMENT.

a. Gross weight and loading—Check load, balance and security.

b. Nose wheel snubbing pin—Engage.

CAUTION

Destructive nose wheel shimmy will result if snubbing pin is not seated.

c. Wheels—Chocked.

d. Fire extinguisher indicator discs in place.

e. Ground battery cart, if available; plug into airplane battery cart receptacle. (If battery cart is used make sure battery master switch is "OFF.")

f. Remove pitot head cover.

g. Visually check contents of fuel and oil tanks, and tank caps for security.

h. Enter the pilot's compartment through the compartment enclosure. The access ladder, if installed, may be extended by holding down on the access ladder control rod, located within the foot step. Retraction of the ladder is accomplished by pushing the ladder up from the ground, or by pulling it up from within the pilot's compartment. On airplanes not equipped with a ladder, enter the compartment by means of the hand and foot-holds located on the side of the fuselage and the nose wheel door.

3. ON ENTERING PILOT'S COMPARTMENT.

Note

A pilot's check list is provided in the pilot's compartment for a quick check of operating instructions.

a. STANDARD CHECK.

(1) Hydraulic fluid supply—"NORMAL LEVEL" on gage.

(2) Hydraulic purolator—turn handle three or four times.

(3) Emergency air brake pressure gage — 450 pounds per square inch minimum.

(4) Carburetor air filter controls *(15, figure 17)*—"DIRECT" position. If dust conditions are present "FILTER."

(5) Landing gear control lever *(5, figure 17)*—"DOWN."

(6) Seat and rudder pedals—adjust as necessary.

(7) Surface controls lock lever *(2, figure 17)*—"UNLOCK" position. Check flight controls for freedom of movement or slack. Set trim tabs at zero.

(8) Emergency hydraulic system selector valve control *(12, figure 18)* "SYSTEM" position.

(9) Hydraulic hand pump lever *(16, figure 17)*—actuate lever and observe the hydraulic pressure gage for pressure increase.

(10) Parking brake control lever *(11, figure 21)* "LOCKED."

(11) Make certain the voltage output from the external power supply (ground battery cart) does not exceed 28.5 volts. Voltages higher than 28.5 may damage the radio and other electrical equipment.

(12) Battery switches *(figure 10)*—"OFF" if external power supply is used, "ON" if not available.

(13) Oil cooler doors—Check for proper operation by holding the oil cooler door switches *(2, figure 18)* in "OPEN" position long enough (15 to 20 seconds) for the oil cooler doors to reach the full open position. Then, hold them in the "CLOSE" position long enough (15 to 20 seconds) for the oil cooler doors to reach the full closed position.

Note

After checking operation, on early airplanes, set doors for starting engines. On late airplanes, incorporating automatically controlled doors, set switch in the "AUTO" position.

(14) Compass and electrical instruments—Check for proper settings and indications.

(15) Engine oil and hydraulic fluid fire shut-off valve *(15, figure 18)* (if installed)—"ON."

(16) Fuel quantity gages *(17 and 20, figure 19, sheet 3)*—Adequate supply.

b. SPECIAL CHECK FOR NIGHT FLIGHTS. *(Figure 11.)*

(1) Pilot's compartment lights—"ON."

(2) Instrument panel lights—"ON."

(3) Cockpit lamps — "ON."

(4) Adjust the rheostat for the engine instrument lights and flight instruments lights so that all instruments can be easily read.

(5) Navigation lights switch—"ON."

(6) Extend the landing lights and test the operation (10 seconds maximum). Use landing lights only as necessary to conserve bulb life and to avoid current load on the batteries when the engines are not running.

(7) Test the operation of the recognition lights. *Do not allow the recognition lights to remain ON longer than necessary (10 seconds maximum) when the airplane is on the ground,* because heat from prolonged use will cause the lenses to melt.

4. FUEL SYSTEM MANAGEMENT. *(Figure 23.)*

a. FUEL TANK SELECTION.—When the engines are operating, the main (nacelle) fuel tanks or the auxiliary (wing) fuel tanks can be selected to supply fuel to the respective engine (left or right-hand engine) or to both engines. On some airplanes a 125 gallon fuel tank is installed in place of the lower turret, and feeds fuel into the bomb bay auxiliary tank by operation of a fuel transfer switch located on the step above the pedestal in the pilot's compartment. If the 155 gallon drop tanks are installed under each wing, switches located on the step above the control pedestal, operate transfer pumps, pumping the fuel into the main tanks. A two-speed fuel booster pump, integral with each fuel tank, facilitates fuel tank selection. After cruising altitude has been attained, use fuel from the tanks in the following order:

(1) MAIN FUEL TANKS FOR FIRST HALF-HOUR.

Note

If wing drop tanks are installed, use main tanks until 200 gallons from each tank is consumed. Transfer fuel from drop tanks to main tanks until drop tanks are empty (approximately one-half hour), and then immediately select next tank to be used.

(2) LONG RANGE BOMB BAY FUEL TANK (IF INSTALLED), OR BOMB BAY AUXILIARY FUEL TANK.

Note

Bomb bay auxiliary fuel tank drains into long range bomb bay fuel tank when long range tank is installed. Use all fuel in these tanks before using next tanks.

(3) AUXILIARY WING TANKS.

Note

If aft fuselage tank is installed immediately begin to transfer fuel from aft fuselage tank to auxiliary bomb bay tank (approximately 20 minutes).

CAUTION

If fuel in aft fuselage tank will be needed to complete mission, transfer to auxiliary bomb bay tank should be begun when auxiliary wing tanks are turned on. If this fuel is not needed, it should be left in aft fuel tank to maintain satisfactory balance, particularly if all nose gun ammunition has not been fired.

(4) BOMB BAY TANK (ONLY IF FUEL HAS BEEN TRANSFERRED FROM AFT FUSELAGE TANK).

(5) MAIN TANKS.

b. FUEL BOOSTER PUMPS.

(1) GENERAL.

(a) During take-offs and landings, booster pumps for the fuel tanks being used must be operating in the "HIGH BOOST" position. At other times during flight, depending upon fuel pressure available and at the discretion of the pilot, booster pumps may be used in either "LOW BOOST" or "HIGH BOOST" positions to ensure fuel pressure.

Note

The fuel booster pumps, in "HIGH BOOST" position, will supply sufficient fuel at an adequate pressure to operate the engines under all conditions, including engine-driven fuel pump failure.

(b) If the fuel booster pumps are needed to maintain pressure the switches should always be on before the fuel selector valve controls are moved.

(c) It is recommended that the bomb bay fuel tanks booster pump switch be placed in the "HIGH BOOST" position before the bomb bay tank cross-feed selector valve control is turned "ON." Subsequently, the switch may be turned to the "OFF" position and then, if sufficient fuel pressure is not available, may be turned to either "LOW BOOST" or "HIGH BOOST" position.

(2) FUEL BOOSTER PUMP SWITCHES. *(7, figure 17.)*

(a) MAIN OR AUXILIARY FUEL TANK BOOSTER PUMP SWITCHES.—These booster pump switches, when in the "HIGH BOOST" or "LOW BOOST" position, operate the pumps for the main fuel tanks and the auxiliary fuel tanks only when the respective tanks are selected by the fuel selector valve control. When the fuel selector valve control is in the "BOTH OFF" position, both the main fuel tank and the auxiliary fuel tank booster pumps are inoperative (even when the booster pumps switches are ON).

(b) BOMB BAY FUEL TANKS BOOSTER PUMP SWITCH.—This switch, located on the control pedestal (either in the "HIGH BOOST" or "LOW BOOST" position), operates the bomb bay tank booster pump regardless of the position (including "OFF") of the cross-feed bomb bay tank selector valve control.

CAUTION

Turn on booster pumps before selecting bomb bay fuel.

(c) AFT FUSELAGE TANK TRANSFER SWITCH.—Operate this fuel transfer switch to transfer fuel from the aft fuselage tank into the bomb bay auxiliary fuel tank only when the 125 gallon fuel tank is installed in place of the lower turret.

CAUTION

Do not transfer fuel until the bomb bay fuel tank can hold the quantity of fuel to be transferred.

(d) WING DROP TANK TRANSFER SWITCH.—Droppable 155 gallon tanks are installed under each wing. Operate the drop tank switches on the step above the control pedestal to transfer fuel from the wing drop tanks into the main tanks.

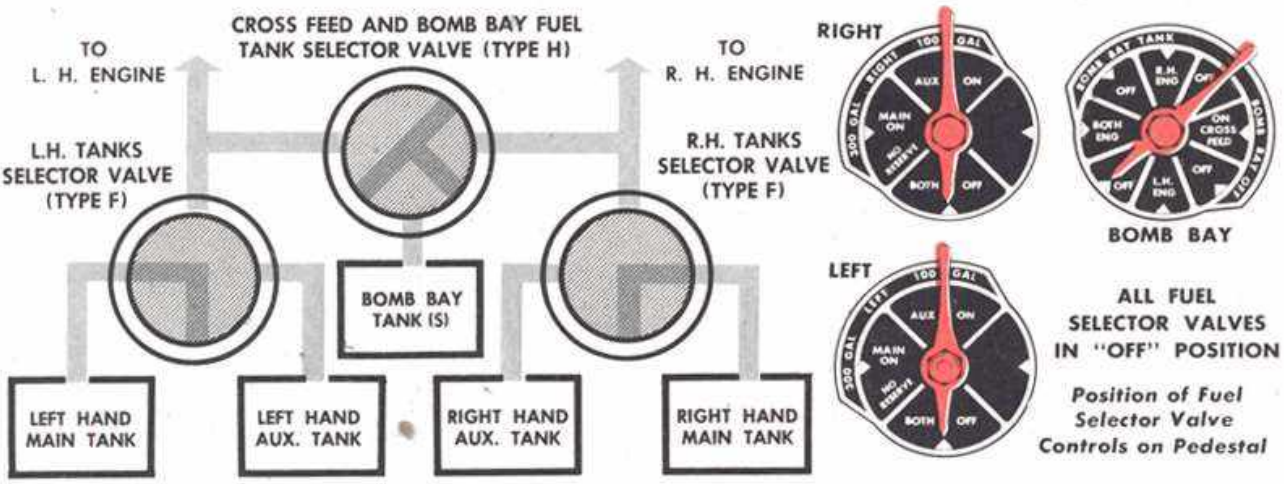
CAUTION

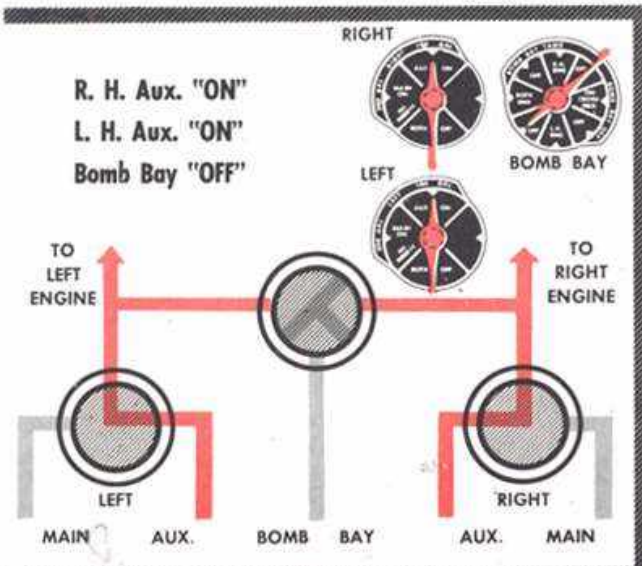
Do not transfer fuel until the main tanks can hold the quantity of fuel to be transferred.

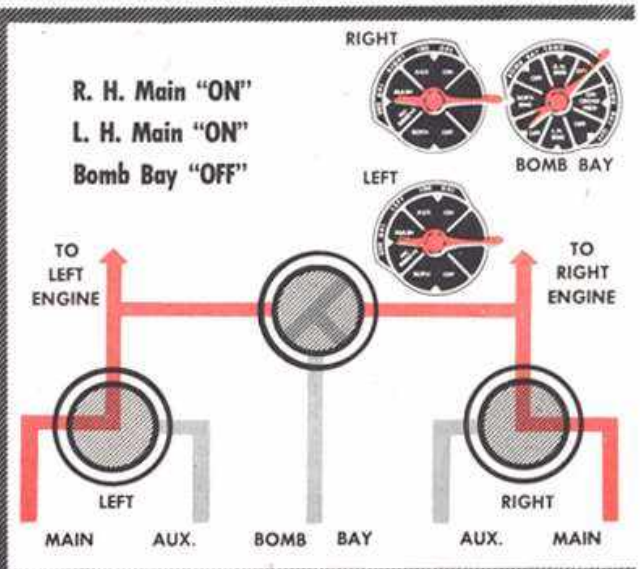
d. CROSS-FEED BOMB BAY TANK SELECTOR VALVE CONTROL.—When fuel is not being used from the bomb bay fuel tank or ferry tank, the fuel cross-feed bomb bay fuel tank selector valve control should normally be in the "OFF" position. The control should be moved to the "CROSS-FEED ON" position only when one of the following conditions exists:

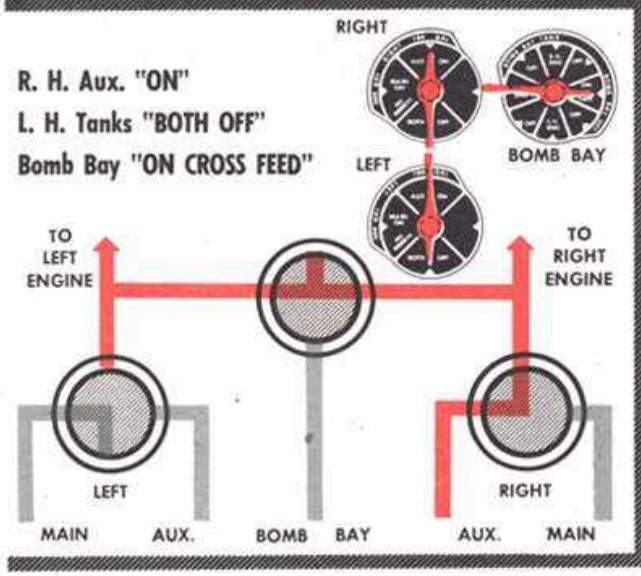
(1) When adequate fuel is not being supplied to an engine for reasons other than a broken fuel line.

(2) When it is necessary to supply fuel to an engine from a fuel tank which is located on the opposite side of the fuselage.









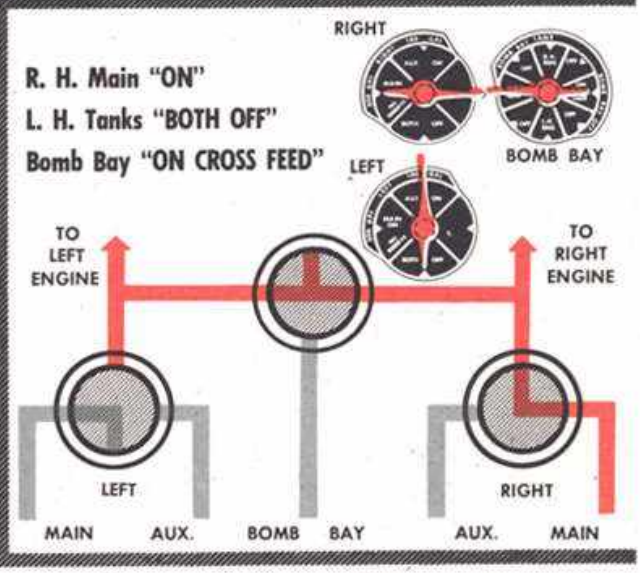


Figure 23 (Sheet 1 of 2)—Alternate Positions of Fuel Tank Selector Valves

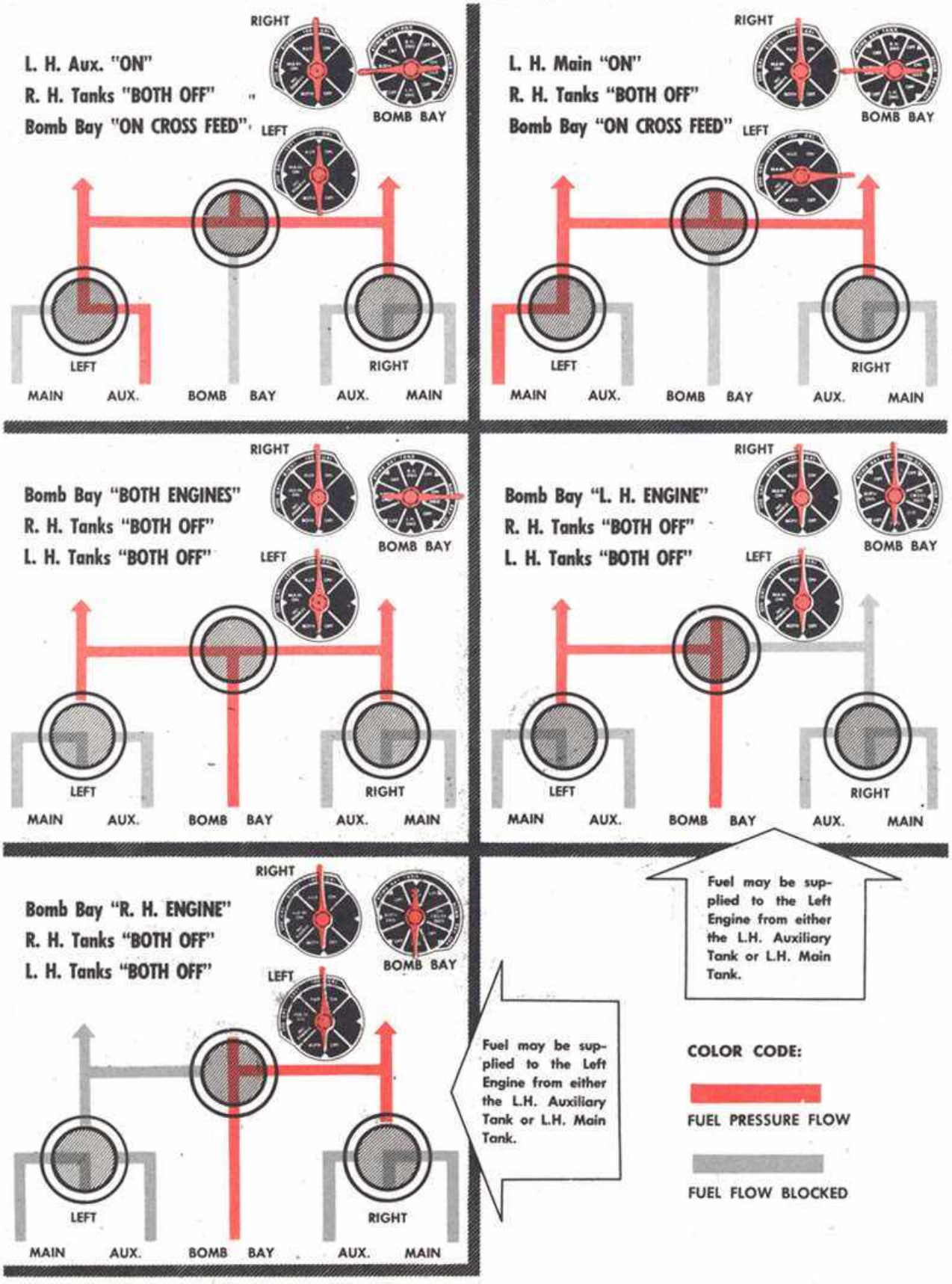


Figure 23 (Sheet 2 of 2)—Alternate Positions of Fuel Tank Selector Valves

e. CARBURETOR VAPOR VENT LINE RETURN.—As the fuel from the carburetor vent line overflows into the main tanks at a rate of approximately two gallons per hour, it is essential to check the quantity of the main tanks frequently to prevent the fuel from flowing overboard. As a further precaution, fuel should be used from the main tanks for approximately the first half hour of flight. Whenever the main tanks are indicated as being full, switch to the main tanks temporarily, then return to the desired operation.

5. STARTING ENGINES.

a. PRELIMINARY PROCEDURE.—If the engines have been idle more than two hours, or if excessive priming has been used in prior starting attempts, manually rotate the propellers 12 blades. Be sure the ignition switches are "OFF." The lower spark plugs should be removed to drain the cylinders if excessively high cylinder compression exists.

b. SET THE FOLLOWING CONTROLS FOR BOTH ENGINES:

(1) Fuel tank selector valve controls *(5 and 6, figure 18)*—"MAIN ON."

(2) Fuel cross-feed and bomb bay tank selector valve control—"OFF."

(3) Mixture controls—"IDLE CUT-OFF."

(4) Throttle controls—¼ open.

(5) Propeller controls—"INCREASE RPM."

(6) Supercharger control levers *(3, figure 17)*—"LOW."

(7) Carburetor air temperature control levers *(14, figure 17)*—"COLD."

CAUTION

Do not start engine with the control in the "HOT" position because serious damage or fire may result from a backfire.

(8) Cowl flaps—"OPEN."

CAUTION

Do not close cowl flaps under any circumstances. If closed, the cylinder head temperature will quickly rise and may exceed the critical temperature, 232°C.

(9) Oil cooler doors—Set to the desired position. On later airplanes set the control to "AUTO" position.

Note

The automatic feature may be cut off if desired, and the doors may be opened or closed by holding the control switch momentarily in the "OPEN" or "CLOSE" position, then allowing the switch to return to "OFF."

(10) Master ignition switch *(figure 9)*—"ON."

(11) Generator switches *(figure 10)*—"ON."

(12) Instrument vacuum selector valve control *(71, figure 21)*—in the applicable position for the engine that is started first—left-hand or right-hand engine.

d. START THE RIGHT ENGINE.

(1) Right wing fuel booster pump switch *(7, figure 17)* "LOW BOOST."

(2) Fuel primer switch *(figure 10)*—"ON" (approximately two seconds).

Note

This is not intended to prime the engine, but to fill the priming lines with fuel so that priming is immediately effective when priming is accomplished.

(3) Prime the engine as necessary before and while accomplishing steps (4) through (6), below.

(4) Move starter energizing switch *(figure 10)* to "R" for about 20 seconds to bring starter up to speed.

(5) Move starter engaging switch *(figure 10)* to "R," continuing to hold the energizing switch.

(6) Right engine ignition switch *(figure 9)*—"BOTH" after propeller has turned over three or four times. Hold engage switch in "R" position until the engine fires.

CAUTION

If the engine does not start after thirty seconds, the starter must be allowed to cool for one minute before attempting to start the engine again.

(7) If the engine starts immediately, move the mixture control to "AUTOMATIC RICH." Adjust the throttle control to maintain 700 rpm for the first thirty seconds after starting. Watch for an indication of oil pressure on the gage.

CAUTION

If oil pressure is not indicated within thirty seconds, stop the engine and investigate.

(8) If the engine does not start almost immediately after the engage switch has been moved to "R," move the mixture control from "IDLE CUT-OFF" to "AUTOMATIC RICH" while maintaining seven to nine pounds per square inch fuel pressure. If the engine does not start within approximately three seconds, return the mixture control to "IDLE CUT-OFF." If starting is not accomplished within approximately the next five seconds, while the mixture control is in "IDLE CUT-OFF," continue to operate the starter, and repeat the procedure. One to three repetitions will usually start the engine.

(9) If the engine does not start, it is probably due to one of the following conditions:

(a) Overloaded engine: An overloaded warm engine is indicated by a discharge of fuel from the engine blower drain. An overloaded cold engine is not necessarily indicated by a discharge of fuel from the engine drain, but by the presence of liquid fuel in the exhaust. If the engine is overloaded, "clear the engine out" by opening the throttles and turning the engine over either manually or with the starter.

(b) Underprimed engine: If there is no fuel odor or vapor in the exhaust, it is probable, especially in cold weather, that the engine has not been sufficiently primed, even though fuel may be draining from the blower. For this reason, priming is necessary to prevent flooding the blower and creating a fire hazard. Additional priming should be accomplished cautiously.

(10) Fuel primer switch *(figure 10)*—"ON" if necessary.

(11) Idle engine at 700-800 rpm.

Note

Protracted idling below 700 rpm may foul the spark plugs.

(12) Oil pressure gage—25 pounds per square inch minimum.

Note

Due to the thermostatic action of the oil pressure relief valve, an abnormally high oil pressure gage may exist until an oil temperature of 40°C. is attained.

(13) Normal fuel pressure is 16 to 18 psi on airplanes without water injection and 22 to 24 psi on airplanes with the water injection.

(14) Hydraulic pressure gage—750 pounds per square inch minimum.

(15) Suction gage—3.5 to 4.75 inches Hg.

e. START THE LEFT ENGINE.—The starting procedure for the left engine is the same as that for the right engine. After starting the engine, move the instrument vacuum selector valve control to "L.H. PUMP" position. Recheck the suction gage (for 3.5 inches Hg. indication) to ascertain that the left engine vacuum pump is functioning properly.

f. INSTRUCTIONS IN CASE OF FIRE.—Be certain adequate fire fighting equipment is near the engine being started. If a fire occurs while starting an engine, move the engine and hydraulic oil shut-off switch *(15, figure 18)* (if installed) to the "CLOSE" position, move the mixture control to "IDLE CUT-OFF"; move the throttle control to "OPEN," and keep the engine turning over with the starter to draw fire from the induction system through the engine.

6. WARM-UP AND GROUND TEST.

a. WARM-UP OPERATIONS.

(1) Run the engines at 1000 rpm.

(2) Instruments—Check for indications consistent with engine speed, excessive pointer oscillation, and over-sensitivity.

(3) With the right engine running, and before starting the left engine, open and close the bomb bay doors, then return the bomb bay door control to "NEUTRAL." As the bomb bay doors are being opened and closed, the hydraulic system pressure will decrease. After the bomb bay doors have reached the "CLOSED" position, the hydraulic system pressure should return to normal. This indicates that the right engine-driven pump is functioning properly.

(4) Manifold pressure drain cock.—Decrease the engine speed to 700 rpm, then open the cock for 30 seconds (for each position) to clear the manifold pressure instrument lines of liquids and vapors.

(5) Operate the engines at 1000 rpm until the following conditions exist:

(a) Oil temperature 40°C.

(b) Oil pressure 50 to 100 pounds per square inch and relatively steady.

(c) Cylinder head temperature 120°C minimum.

(6) Do not close cowl flaps.

(7) Generators.

(a) Check generator "CUT-IN."

1. Throttle controls—Set for 1000 rpm.

2. Right engine generator:

a. Right engine generator switch *(figure 10)*—"ON."

b. Voltmeter check switch *(figure 9)*—"R" position. (Some airplanes only.)

c. Battery switches *(figure 10)* and left engine generator switch—"OFF."

d. Right engine throttle control—Move gradually toward "OPEN" and observe the tachometer for the rpm at which the voltmeter shows the right engine generator to have started charging (1500 rpm desired).

3. Left engine generator: Check "Cut-in" of the left engine generator in a similar manner.

4. Turn "ON" both battery switches and both generator switches.

(b) Check each generator "OUTPUT."

1. Throttle controls—Set for 1700 rpm.

2. Ammeters—With the battery switches "ON" or other electrical load, the ammeters should show an increase in generator output.

3. Voltmeter check switch (some airplanes only)—Move to "L," then to "R." The voltmeter indication should not exceed 28.5 volts, and *both* indications should be the same.

CAUTION

Avoid prolonged engine speeds of 1400 to 1500 rpm as the generator will "cut-in" and "cut-out" excessively, causing overheating and damage to the breaker points.

b. GROUND TEST OPERATIONS.

(1) ENGINE CHECK.—With parking brake applied, run-up both engines at the same time until 30 inches Hg. manifold pressure is reached; then check the engine rpm, fuel pressure, cylinder head temperature, oil pressure, and oil temperature to make certain that all indications are within the limits in the Power Plant Chart *(figure 25)*.

(2) PROPELLER GOVERNORS—With the engines operating at 1600 rpm, move the propeller controls toward "DECREASE RPM" position until a drop in engine rpm is evidenced; then return the control to "INCREASE RPM" position. Repeat this procedure three or four times during cold weather. Minimum governing speed is 1200 rpm.

(3) TWO-SPEED SUPERCHARGER.—This test is made to prevent sludge accumulation, and to check the operation of the blower mechanism.

(a) Set the throttle controls for 1700 rpm. Ascertain that the oil pressure is at least 50 pounds per square inch.

(b) Supercharger blower controls *(3, figure 17)*—Shift to "HIGH" position: At the same time, observe the engine oil pressure gage for a momentary "drop" in pressure, and check the manifold pressure gage to make certain that the manifold pressures do not drop.

Note

Prolonged fluctuation or loss of manifold pressure indicates improper clutch engagement: In this case, the supercharger blower control lever should be returned to the "LOW" position, the engine speed reduced to 1000 rpm, and the test repeated.

(c) While in "HIGH" blower open throttles to obtain 30 inches Hg. manifold pressure (maximum) at sea level and lock the throttle controls at this setting. Make certain the oil temperatures, oil pressures, cylinder head temperatures, and fuel pressures are within the operating range as shown on the Power Plant Chart.

(d) Immediately shift the supercharger blower control levers to "LOW" position without hesitation (in order to avoid dragging or slipping the clutches). At the same time, observe the manifold pressure gage for an indication of a sudden "pressure drop."

Note

A manifold "pressure drop" is positive indication that the control system is functioning properly. If the manifold pressure does not decrease, operate the engine at 1000 rpm for two minutes. This permits heat generated during the clutch operation to dissipate.

(e) As soon as the test is complete, reduce the engine speed to 1000 rpm.

(f) Supercharger blower control levers—"LOW" position when the test is complete.

(4) IGNITION SYSTEM. – Check the magnetos on each engine separately.

(a) Throttle control—With the propeller control in "INCREASE" rpm open throttle to 30 inches Hg. manifold pressure (at sea level).

(b) Move ignition switch from "BOTH," to "LEFT," to "BOTH," to "RIGHT," to "BOTH," allowing engine to regain speed between checks (50 to 100 rpm drop off normal.)

(c) If, during the test, one of the following conditions exists, stop the engines and inspect for malfunctions:

1. If the "drop off" exceeds 100 rpm on either "LEFT" or "RIGHT."

2. If the difference between the "drop offs" exceeds 40 rpm with the switches in either the "LEFT" or "RIGHT" positions.

3. If the engine vibrates excessively.

CAUTION

Make this check in as short a time as practicable (30 seconds maximum). Cooling of the cylinder heads, barrels, and ignition harness is insufficient when the engines are operated for prolonged periods above 1400 rpm. Do not allow the cylinder head temperatures to exceed 232°C.

(5) FUEL TANK SELECTION TEST.—Operate the engines, using fuel from each fuel tank for a period of 3 minutes to make certain the selector valves operate properly. Run the engines for 3 minutes with the bomb bay cross-feed valve control *(4, figure 18)* set at "ON CROSS-FEED" with either the right or the left selector valve "OFF" and the other selector valve set at "MAIN ON." After the test has been completed, return the bomb bay cross-feed valve control to "OFF" and both selector valves to "MAIN ON."

(6) ADDITIONAL CHECKS.

(a) Battery switches *(figure 10)*—"ON."

(b) Battery cart (if used)—Disconnected.

(c) Ladder *(46, figure 21)*—Retracted.

(d) Enclosures, exits, and doors—Closed and secured.

(e) Surface controls lock lever *(2, figure 17)* —"UNLOCKED."

(f) Landing gear safety pins—Removed and stowed.

(g) All obstructions clear of the airplane.

(h) Wheel chocks—Removed.

7. SCRAMBLE TAKE-OFF.

Start engines in normal manner, then if the engine oil was properly diluted when the engines were previously stopped, the oil pressure should quickly steady itself within the limit set forth on the "Power Plant Chart" *(figure 25)*. If the oil pressure is too high, fluctuates, or falls back when the engine rpm is increased, the oil dilution system may be operated to correct this condition; however, the oil pressure gage should be watched carefully as over dilution and low oil pressure are likely to result under these conditions. The airplane may be flown, as soon as there has been a definite rise (10°C) in the oil temperatures, the oil pressures are steady, and the engines are running smoothly.

8. TAXIING.

a. Throttle controls—Adjust for even engine power (at approximately 1000 rpm).

b. Parking brake control *(11, figure 21)* – "RELEASE."

c. After the forward roll has been started, directional control is accomplished by using the rudder, differential engine power, brakes, or a combination of the three. *Use the rudder and differential engine power whenever possible to minimize brake wear.* Forward rolling motion is necessary before nose wheel castering can be accomplished. The slower the rolling speed, the greater the amount of nose wheel castering available. Avoid sharp turns beyond the limitations of the nose wheel castor to minimize uneven tire wear.

d. Avoid taxiing over rough or soft terrain or through tall grass; but if it is necessary to do so, use minimum forward speed. Carefully observe the terrain to be traversed by the nose wheel; sinking or

dropping of the nose wheel to a lower level than normal subjects the nose wheel strut to heavy loads. Forward loads may be minimized by full "UP" elevator and minimum braking. A sealed beam spotlight is installed on the nose wheel strut of some modified airplanes for taxiing purposes. The light is controlled by a switch located on the pilot's overhead control panel.

CAUTION

Do not taxi the airplane with nose gear strut inflated to more than four inches extension.

e. Taxiing speed is limited only by the precautions noted above. When the taxiing speed is increased, nose wheel action and nose wheel control are stabilized and ground looping is remote.

f. When a position opposite the end of the runway has been reached, apply the brakes evenly and, as the airplane approaches a standstill, reduce the braking gradually to minimize nose pitching.

9. TAKE-OFF.

a. SAFETY CHECK BEFORE TAKE-OFF.

(1) Fuel container selector valve controls *(5 and 6, figure 18)*—"MAIN ON."

(2) Bomb bay cross-feed control—"OFF."

(3) Right and left-hand fuel booster pump switches *(7, figure 17)*—"HIGH BOOST" (16 to 25 pounds per square inch fuel pressure).

(4) Bomb bay booster pump switch—"OFF."

(5) Fuel quantity gages—Adequate supply.

(6) Mixture controls—"AUTO RICH."

(7) Supercharger blower controls *(3, figure 17)* —"LOW."

(8) Carburetor air temperature controls, *(14, figure 17)*—Full "COLD."

(9) Cowl flaps—½ open.

(10) Bomb bay doors *(figure 9)*—"CLOSED."

(11) Propeller governor controls — "INCREASE RPM."

(12) Wing flaps control *(13, figure 17)*—Use ¼ flap (20° recommended, 15° minimum) for take-off.

(13) Oil cooler door switches—Readjust as necessary to maintain an oil temperature within the limits specified in the Power Plant Chart *(figure 25)*. On later airplanes the doors are automatically controlled when the switch is placed in the "AUTO" position.

(14) Hydraulic system pressure gage — 750-1000 pounds per square inch.

(15) Trim tab controls *(8, figure 17; 7 and 11, figure 18)*—"0" degrees.

(16) Altimeter *(26, figure 19, sheet 3)* — Set at proper reading.

(17) Cockpit heater master switch—"OFF."

WARNING

Never take off with snow, ice or frost on the wings which will cause loss of lift and treacherous stalling characteristics.

b. TAKE-OFF.

(1) With brakes applied, run up both engines until 30 inches Hg. manifold pressure is reached. Make a final brief engine instrument check and push throttles open to take-off power for rpm and manifold pressure check.

Note

Use full throttle for take-off above 1600 feet altitude.

(2) Taxi the airplane to take-off position and advance both throttle controls to maximum take-off power in accordance with the Power Plant Chart *(figure 25)*.

(3) Adjust the throttle friction lever *(12, figure 17)* in order to prevent throttle creeping during take-off.

(4) When the stalling speed, for the weight and wing flap setting used, is reached, raise the nose wheel just clear of the ground. At this angle of attack, allow the airplane to fly clear of the ground.

Note

If the terrain is rough, it may be necessary to raise the nose wheel just off the ground before flying speed has been reached to avoid undue stress on the nose wheel structure.

(5) *The indicator,* Normal Rated power on, stalling speeds of the airplane are as follows:

GROSS WEIGHT (LBS.)	27,000	32,000	35,000
Flap Setting	*Indicator*	*Airspeeds*	*(MPH)*
20 degrees	94	103	108
*38 degrees	85	94	100

*38-degree flap angle should be used for take-off only when minimum ground run is desired.

WARNING

These speeds are indicator readings which, near a stall condition, are higher than true indicated airspeeds due to the position error of the airspeed system.

(6) In order to attain single engine airspeed as soon as possible, retract the landing gear and the wing flaps as soon as a definite climb has been established.

Note

The minimum controllable single engine airspeed is 140 mph for Military, take-off, and Normal Rated Power over a gross weight range of 27,000 to 32,000 pounds and 160 mph from 32,000 to 34,000 pounds. Single engine level flight is limited to approximately 35,000 pounds or less.

(7) Landing gear control lever *(5, figure 17)*—"UP." When the landing gear position indicator and the landing gear warning lights indicate the landing gear is fully retracted, move the control lever to the "NEUTRAL" position.

(8) Wing flap control lever *(13, figure 17)*—"UP."

(9) Maintain take-off power and allow the airplane to attain single engine control speed before starting climb.

(10) Retract landing lights (if used) as soon as climb is established.

(11) Refer to the "Power Plant Chart" *(figure 25)* for additional engine performance figures and limits.

(12) Refer to "Take-Off, Climb, and Landing Chart," *(figure 55),* for additional information pertinent to take-off distances at various gross weights and conditions.

10. ENGINE FAILURE DURING TAKE-OFF.

a. FAILURE ON THE GROUND.

(1) Do not attempt to take-off.

(2) Close the throttles and apply the brakes.

(3) Ignition, generator, and the battery switches —"OFF."

(4) Fuel tank selector valve controls *(5 and 6, figure 18)* and bomb bay cross-feed valve control—"OFF."

Note

If it is necessary to stop the airplane in a shorter distance than normal or air brakes will permit, retract the landing gear; reach back, push the solenoid locking pin on auxiliary control *(see figure 6)* and turn the control handle.

(5) Engine oil and hydraulic fluid fire shut-off valve *(15, figure 18)* (if installed)—"CLOSE."

b. ONE ENGINE FAILURE IN THE AIR PRIOR TO REACHING SINGLE ENGINE AIRSPEED. (Minimum of 140 mph for take-off below 32,000 lbs., 160 above.)

(1) Close the throttles, lower the wing flaps, and maintain "straight ahead" directional control in preparation to land.

(2) If there are obstacles or rough terrain ahead, retract the landing gear.

(3) Ignition, generator, and battery switches — "OFF."

(4) Fuel tank selector valve controls and bomb bay cross-feed valve control—"OFF."

(5) Engine oil and hydraulic fluid fire shut-off valve (if installed)—"CLOSE."

(6) Land straight ahead.

c. ONE ENGINE FAILURE IN THE AIR AFTER REACHING SINGLE ENGINE AIRSPEED.

(1) Lower the airplane nose sufficiently to allow the airplane to accelerate.

(2) Retract the landing gear if not already in the retracted position.

(3) Retract the wing flaps gradually by moving the wing flap control *(13, figure 17)* intermittently from "NEUTRAL" to "UP."

(4) Rubber trim tab—Apply sufficiently to maintain directional control.

(5) If bombs are carried, do not attempt to release them until a safe altitude has been gained. Make certain the bomb arming switch is in the safe ("OFF") position.

(6) Adjust the operative engine controls to maintain Normal Rated power. Refer to the "Power Plant Chart" *(figure 25).*

(7) The airplane will climb satisfactorily with only one engine operative at the following gross weights:

Gross Weight (Lbs.)	Manifold Pressure Inches Hg.	RPM	Indicator Speed for Best Climb (Mph)	Usable Single Engine Ceiling Ft.
27,600	42.0*F.T.	2400	155	14,000
28,000	42.0 F.T.	2400	155	13,000
30,000	42.0 F.T.	2400	160	10,000
32,000	42.0 F.T.	2400	165	6,500
34,000	42.0 F.T.	2400	170	2,500

*Full throttle above 8,000 ft. in low blower.

(8) Adjust the operative engine cowl flaps as necessary to prevent the engine cylinder head temperature from exceeding 260°C.

(9) Bomb bay fuel cross-feed valve control — "OFF."

(10) Instrument vacuum selector control *(71, figure 21)*. Set to the position for the operative engine.

(11) Set the inoperative engine controls and feather the propeller as follows:

(a) Throttle control—"CLOSED."

(b) Propeller feathering control *(6, figure 17 or figure 9)*—Push DOWN to the feathered position. If the propeller does not feather within 90 seconds, interrupt the feathering operation by pulling the propeller feathering control to the OUT position.

(c) Cowl flaps *(3, figure 18)*—"CLOSE" position.

(d) Oil cooler door *(2, figure 18)*—"CLOSE."

(e) Fuel tank selector valve control *(4, 5 and 6, figure 18)*—"OFF."

(f) Engine oil and hydraulic fluid fire shut-off valve (if installed)—"CLOSE."

(g) Fuel booster pump switch *(7, figure 17)*—"OFF."

(h) Engine ignition switch *(figure 9)—"OFF"* position as soon as the engine stops.

(i) Generator switch *(figure 10)*—"OFF."

(12) If an attempt is made to re-start the inoperative engine proceed with the following instructions:

(a) Engine ignition switch—Move to the "BOTH" position.

(b) Fuel booster pump switch — "HIGH BOOST."

(c) Fuel tank selector valve control—Move to the position for the desired tank.

(d) Propellor control—"DECREASE" rpm.

(e) Propeller feathering control—Push DOWN until the propeller windmills at 600 to 800 rpm; then release the control.

(f) When the engine oil pressure gage indicates a minimum of 50 pounds per square inch move the mixture control to "AUTO RICH."

(g) Warm up the engine at minimum governing rpm. Gradually move the throttle and propeller controls to the desired settings.

(h) Run the engine at reduced engine power until the engine oil and the cylinder head temperatures indicate a safe operating condition.

(13) If prolonged single engine flight is necessary, after a minimum altitude of 500 feet has been attained, trim the airplane to fly directionally straight. If prolonged single engine flight is not necessary, prepare to land as outlined in Section IV, paragraph 3. *b.* (1).

11. CLIMB.

a. Climbs should normally be made with approximately Normal Rated Power—however, for combat climbs, Military Power may be used for a period not to exceed five minutes.

b. Reduce engine power as follows and in accordance with the arrows:

THROTTLES In. Hg.	PROPELLERS r.p.m.	CONDITION
52"	2700	TAKE-OFF (5 Minutes Only)
STEP 1		
STEP 2		MAXIMUM CONTINUOUS POWER (Rated Power)
42"	2400	
STEP 3		
33"	2100	MAX. CRUISING

c. Refer to the "Take-off, Climb, and Landing Chart," *(figure 55)*, for the best climbing airspeeds, time limitations on engine power, and supercharger blower control settings.

d. Use "AUTO RICH" mixture for all climbs, regardless of power conditions.

Note

During climb engines may be operated in excess of 232°C. as long as 260°C. is not exceeded.

e. Carburetor air filter controls *(15, figure 17)*—"DIRECT" position when an altitude has been attained where air is free from dust.

f. Cowl flaps *(3, figure 18)*—Adjust as necessary in order to maintain engine cylinder head temperatures less than 232°C.

g. If engine cylinder head temperatures and engine oil temperatures cannot be maintained below 260°C. and 100°C. respectively when the cowl flaps and oil cooler doors are in the full open position, reduce the angle of attack and fly at indicated airspeeds 10 to 20 mph higher than those specified in the "Take-Off, Climb, and Landing Chart."

h. Carburetor air temperature control *(14, figure 17)* full "COLD" unless icing conditions exist. If icing conditions do exist, adjust to maintain at least 15°C. carburetor air temperature, after power is reduced.

12. GENERAL FLYING CHARACTERISTICS.

a. GENERAL.

(1) Stability:

(a) With normal and full military loads, the airplane is stable.

(b) Center of gravity limits are 18 to 32 percent M.A.C. When flying this airplane at extreme conditions of center of gravity loading, instability is approached.

(c) Do not subject the airplane to high acceleration loading during steep turns or when recovering from a dive at high speed.

(2) Trim:

(a) Elevator trim tabs: The elevator trim tabs are very effective; therefore, use slowly as necessary.

(b) Flaps down: No excessive change in trim.

(c) Landing gear down: Nose heavy.

(d) Bomb bay doors open: No longitudinal change, but the airplane becomes very stable directionally.

(e) Cowl flaps open: Slightly tail heavy.

(f) Dive: Stable.

(g) One engine failure: Nose heavy, but directionally stable.

b. CHANGING POWER CONDITIONS DURING FLIGHT.

(1) Refer to the "Power Plant Chart" *(figure 25)* for limits and engine performance data for various operating conditions. Refer to the "Flight Operation Instruction Charts" *(figure 56)* for the desirable settings of the engine controls when the flying distance is predetermined, and for all the alternate cruising conditions.

(2) For minimum fuel consumption (max. endurance not max. range) operate at reduced engine power. Reduce the engine power by means of lower engine speed rather than by reduced manifold pressures at high engine speed.

(3) To prevent excessive cylinder pressures, when changing power conditions, use the following procedure:

(a) INCREASING POWER.

1. Mixture control levers—"AUTO RICH."

2. Propeller governor controls—Adjust to obtain the desired engine rpm.

3. Throttle controls — Readjust as necessary.

4. Mixture controls — Adjust to the proper setting for the desired cruising condition, if necessary.

(4) Apply carburetor heat for 1 to 2 minutes every ½ hour during flight to preclude the possibility of carburetor icing.

c. SUPERCHARGER USE AND LIMITATIONS.

(1) When critical altitudes for low blower have been reached, partially close the throttle to reduce manifold pressure 3 to 4 inches Hg. and shift supercharger control rapidly, without pausing, to the "HIGH" position notch. Use low and high blower positions in accordance with "Flight Operation Instruction Charts." *(Appendix 1.)*

(2) With the blower control in the "HIGH" position, operate the engine essentially as a single speed engine. If possible, avoid excessively high rates of change in engine rpm when operating in the "HIGH" position.

CAUTION

Do not exceed 47 inches manifold pressure in high blower unless water injection system is used.

(3) If the airplane is being operated with the blower controls continuously in one position, shift the blower controls to the other position (either "HIGH" or "LOW") for a period of five minutes at two-hour intervals to wash away any sludge accumulated in the blower clutches.

d. AUTOMATIC PILOT (if installed).

(1) ENGAGING.

(a) BEFORE TAKE-OFF.

1. Unless the knobs on the auto pilot control panel are known to be properly adjusted, turn them to "POINTERS-UP" position.

2. Center "TURN CONTROL," and make sure that control transfer knob is at "PILOT."

3. Engage Auto Pilot clutch by turning knob clockwise.

4. Disengage bombsight clutch by pulling clutch lever toward you.

(b) AFTER TAKE-OFF.

1. Turn "ON" Master and Stabilizer switches connected by bar.

2. After five minutes, turn on PDI Servo switch on the Auto Pilot Control Panel.

3. Turn "ON" tell-tale lights or open shutter.

4. After leveling off at cruising altitude, "Set on the step" and trim airplane for straight and level flight.

5. After master switch has been "ON" for ten minutes (to be sure gyros are erect) center PDI. PDI can be centered by either pilot or bombardier.

6. Level the wings. Maintain directional and longitudinal control as soon as tell-tale lights go out. Turn on aileron, rudder, and elevator switches in that order.

7. Observe PDI, Artificial Horizon and Rate-of-Climb or Altimeter instruments, and then carefully return all centering knobs until airplane is flying as straight and level as possible, with PDI on center.

8. With Autopilot clutch engaged and bombsight clutch disengaged, all course corrections must be made only with Autopilot Turn Control.

e. WATER INJECTION (WAR EMERGENCY POWER) USE.

(1) Refer to the "Power Plant Chart" *(figure 25)* for limits and engine performance data for War Emergency power operating conditions.

(2) During flight at low temperatures when water is being carried in the system, the water injection pump switches *(figure 9)* should be "ON" continuously to circulate the water and operate the heaters which prevent freezing.

Note

As water injection begins, a momentary roughness or cut in the engines should be expected. As the engines smooth out, a decrease in cylinder head temperatures will be noted.

(3) Both water pump switches—"ON."

(4) In "Low Blower" at 2700 rpm full throttle.

(5) In "High Blower" at 2700 rpm full throttle.

CAUTION

Do not use high blower below 10,000 feet.

(6) When water supply has been depleted or the water pressure drops, the pressure warning lights come on; power must be reduced to Military Power Limits.

CAUTION

Reduce engine power immediately to avoid serious engine damage from detonation.

13. STALLS.

a. STALLING SPEEDS.—The *indicator,* power off, stalling speeds for various gross weights and conditions are approximately as follows:

GROSS WEIGHT (LBS.)	27,000	32,000	35,000
Flap Setting	Indicator Airspeeds (MPH)		
0 degrees	124	135	141
20 degrees	113	123	129
38 degrees	105	114	119
52 degrees	101	110	116

b. CHARACTERISTICS.

(1) Gentle buffeting warns of the impending stall.

(2) There is a marked increase in elevator control forces just prior to the stall (10 mph above stalling speed).

(3) When stalled, the airplane has very little tendency to roll.

(4) Maintaining the airplane at a stall results in severe tail buffeting.

c. RECOVERY.—If altitude permits, accomplish the recovery gently, but firmly. Normal procedure is used for corrective measures.

14. SPINS.

If an inadvertent spin occurs, recovery is normal; attention should be given to the wing loading during the "pull-out."

CAUTION

If an uncontrollable spin is allowed to develop below 5000 feet, abandon the airplane.

15. ACROBATICS.

Acrobatics are strictly prohibited.

16. DIVING.

a. This airplane is not designed for dive bombing operations; however, dives are permitted provided the indicated air speed does not exceed 425 mph. If trimmed "hands off" in level flight at cruising power there will be no appreciable change in trim during the dive. Do not use trim tabs to aid in recovering from dives, as excessive load factors may be encountered. Do not exceed the maximum safe engine overspeed of 2980 rpm (30 seconds).

b. Close the cowl flaps during a dive.

c. Recovery is normal, but avoid rapid "pull-outs," and approximate diving speeds as follows:

Limiting diving speeds.

Weight	I.A.S.
26,000	425
29,500	425
33,000	385
36,500	350

17. NIGHT FLYING.

a. EXTERNAL LAMPS. *(Figure 11.)*

(1) LANDING LAMPS.—The retractable landing lamps are extended or retracted by the landing lamp switch located on the overhead electrical control panel. The landing lamps are automatically turned on when extended and turned off when retracted. Since landing lamps have an illumination life of approximately 30 hours use them only as necessary.

(2) POSITION AND FORMATION LAMPS. — The position and formation lamp switches are located on the main electrical control panel.

(3) RECOGNITION LIGHTS.—The recognition lights control box is located on the left side of the pilot's compartment. The push button on the top of the box operates the lights for code signaling when the switches are in the "KEY" position. When the switches are in the "STEADY" position, the lights are on and the push button is inoperative.

CAUTION

Do not allow the lamp to remain on for more than 10 seconds when the airplane is on the ground. Prolonged use will cause the lenses to melt.

b. NIGHT LANDING.—When landing at night or during periods of poor visibility, land with the nose wheel lower than usual. It is safer to land with the airplane in this attitude and risk the nose wheel striking the ground at higher airspeeds than to risk landing the airplane at a lower landing airspeed at an attitude that may result in a stall and pitch forward.

18. APPROACH AND LANDING.

a. NORMAL APPROACH AND LANDING.

(1) PRELIMINARY APPROACH.—Immediately lower wing flaps ¼ to lower the nose, thus increasing visibility and decreasing airspeed prior to lowering landing gear.

(a) Fuel tank selector valve controls *(4, 5 and 6, figure 18)*—In position for the fuel tank which has an adequate fuel supply, preferably the main (nacelle) fuel tank.

(b) Bomb bay cross-feed valve control—"OFF."

(c) Mixture controls—"AUTO-RICH."

(d) Left and right fuel booster pump switches *(7, figure 17)*—"HIGH BOOST."

(e) Fuel pressures—16 to 25 pounds per square inch.

(f) De-icer system switch (if installed)—"OFF."

(g) Master cockpit heater switch—"OFF."

(h) Propeller governor controls—Set for 2400 rpm.

Note

With the propeller controls in this position, more rapid throttle adjustment also can be accomplished without the danger of serious

overspeeding. It also affords more than Normal Rated Power, which is available for emergency use. Full take-off power is available by advancing the throttles, then immediately moving the propeller controls to "INCREASE RPM" position.

(i) Supercharger controls *(3, figure 17)*—"LOW."

(j) Cowl flaps *(3, figure 18)*—"CLOSED."

(k) Carburetor air temperature controls *(14, figure 17)*. If icing conditions do not exist—"COLD." If icing conditions exist—"HOT."

(l) Parking brake control *(11, figure 21)* "RELEASE" position.

(m) Carburetor air filter controls *(15, figure 17)* —"FILTER" position before descending to an altitude where there is dust in the air.

(n) Brake pedals—Depress, then observe the hydraulic system pressure gage for 750 pounds per square inch minimum pressure.

Note

If there is no indication of hydraulic system pressure and system pressure cannot be increased by actuating the hydraulic hand pump, prepare to use the emergency air brake during landing.

(o) Landing gear control *(5, figure 17)*—"DOWN." Never extend the gear at a speed over 160 mph ias.

CAUTION

Leave the control in "DOWN" position in order to utilize full down-line pressure.

(p) As the landing gear is extended, use trim tabs as necessary.

(q) Wing flap control lever *(13, figure 17)*—"LANDING." Never extend the wing flaps at a speed over 208 mph ias.

(r) It may be necessary to partly open the cowl flaps, depending upon the engine power, the airspeed, and the outside temperature. If emergency power is required, further adjustment of the cowl flaps can be made after more urgent duties have been completed.

(2) FINAL APPROACH AND LANDING.

(a) Refer to the "Take-Off, Climb, and Landing Chart" *(figure 55)*, for the necessary landing run.

(b) Normal landings where minimum distance is not required.—For normal landings where adequate runway is available three-fourths flaps may be preferred to full flaps. For landing weights of 28,000 to 30,000 pounds at these reduced flap settings, approach speeds over the landing field boundary should be 5 to 10 mph higher at the corresponding condition than the values listed below for minimum distance landings. For all landings, it is advisable to make the maneuvering approach in Traffic Pattern at 145 to 150 mph and to *use power during the landing approach and landing flare.*

(c) Minimum Distance Landing, Wing Flap FULL DOWN.—Make the final approach for landing at the approximate indicator airspeeds over the landing field boundary as given below:

GROSS WEIGHT (LBS.)	27,000	32,000
CONDITION	INDICATOR AIRSPEEDS	(MPH)
Power On	120	130
One Engine Inoperative	130	140

(d) Make a power-on approach with attitude only slightly nose high. Do not raise nose too high or nose wheel will drop rapidly at the stall.

(e) If ¾ flap is used, lower to "FULL DOWN" after wheels touch.

(f) Brakes—Apply after all three wheels are on the ground. If nose wheel shimmy is apparent, apply the brakes cautiously at low rolling speeds (when the shimmy is less) provided the length of landing field permits the delayed use of the brakes.

(g) Raise flaps at end of landing run.

(3) CROSS-WIND LANDING.

(a) Make a longer and lower approach than normal to allow sufficient time to establish a heading that will result in a ground track parallel to the runway.

(b) Alter the course of the airplane just prior to ground contact so that the airplane heading will be parallel to the runway.

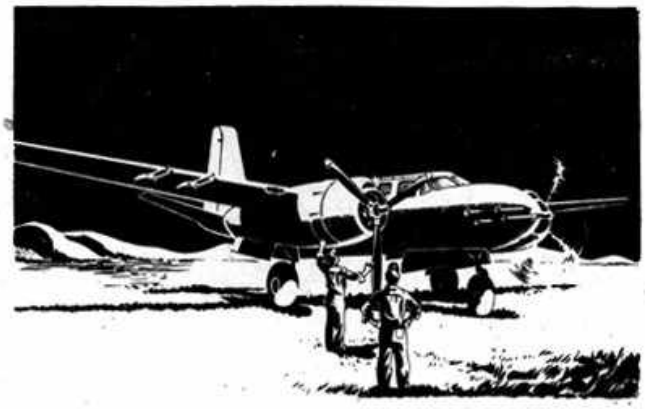
(4) EMERGENCY TAKE-OFF IF LANDING IS NOT COMPLETED.

(a) Apply take-off power by opening throttles, then moving propeller controls to "INCREASE RPM."

CAUTION

Do not suddenly open the throttles, because this will overspeed the engine and may cause engine damage.

(b) Retract the landing gear and the wing flaps AFTER the stalling airspeed for the weight (at which the airplane is flying) and wing flap UP condition has been exceeded.



19. STOPPING ENGINES.

a. STOPPING ENGINES DURING WARM WEATHER.

(1) Cowl flaps *(3, figure 18)*—"OPEN." This facilitates the circulation of air over the engines. Residual heat above 120°C. (248°F.) within the engine section may damage the spark plug electrical insulation.

(2) Propeller controls—"INCREASE RPM."

(3) Fuel booster pump switches *(7, figure 17)*—"OFF."

(4) Idle the engines at 1000 rpm a sufficient length of time to allow the cylinder head temperature to decrease below 205°C.

(5) *Stop the right engine in the following manner:*

(a) Mixture Control—"IDLE CUT-OFF."

(b) Throttle—"CLOSE."

Note

If the "idle cut-off" position does not stop the engine, turn off the ignition switch. *Slowly* open the throttle wide. An improperly adjusted carburetor is indicated if it is necessary to stop the engine by turning the ignition switch off.

(c) Ignition switch *(figure 9)*—"OFF" after the engine stops.

(d) Generator switch and battery switch—"OFF."

(6) To check hydraulic pumps—Hydraulic pumps should be checked individually at frequent intervals in the following manner:

(a) Stop one engine.

(b) Actuate the bomb bay doors until hydraulic pressure drops below normal.

(c) Observe hydraulic pressure gage for a pressure recovery above normal 750 pounds per square inch after operation is completed.

Note

Paragraph 6. *a.* (3) of this section explains check of the right engine hydraulic pump after starting the engine. Paragraph (6) above should be applied when stopping the right engine first. This will allow checking the left engine hydraulic pump. Both hydraulic pumps have thus been checked without resorting to extra operations.

(7) *Stop the left engine* in a manner similar to that for stopping the right engine. Turn off the ignition, battery, generator, and all other switches.

b. STOPPING ENGINES DURING COLD WEATHER.—See section VI.

20. BEFORE LEAVING PILOT'S COMPARTMENT.

a. Mixture controls—"IDLE CUT-OFF."

b. Fuel tank selector valves *(5 and 6, figure 18)*—"OFF."

c. Fuel cross-feed and bomb bay tanks selector valve control *(4, figure 18)*—"OFF."

d. Water injection switches *(figure 9)* (if installed)—"OFF."

e. All electrical switches *(figure 11)*—"OFF."

f. Radio equipment switches *(figure 32)*—"OFF."

g. Automatic pilot switches (if installed)—"OFF."

h. Landing gear control *(5, figure 17)*—"DOWN" (and solenoid locking pin) in extended position.

i. Wing flaps control *(13, figure 17)*—"NEUTRAL."

j. Aileron, elevator, and rudder trim tab controls—Set at "0" degrees.

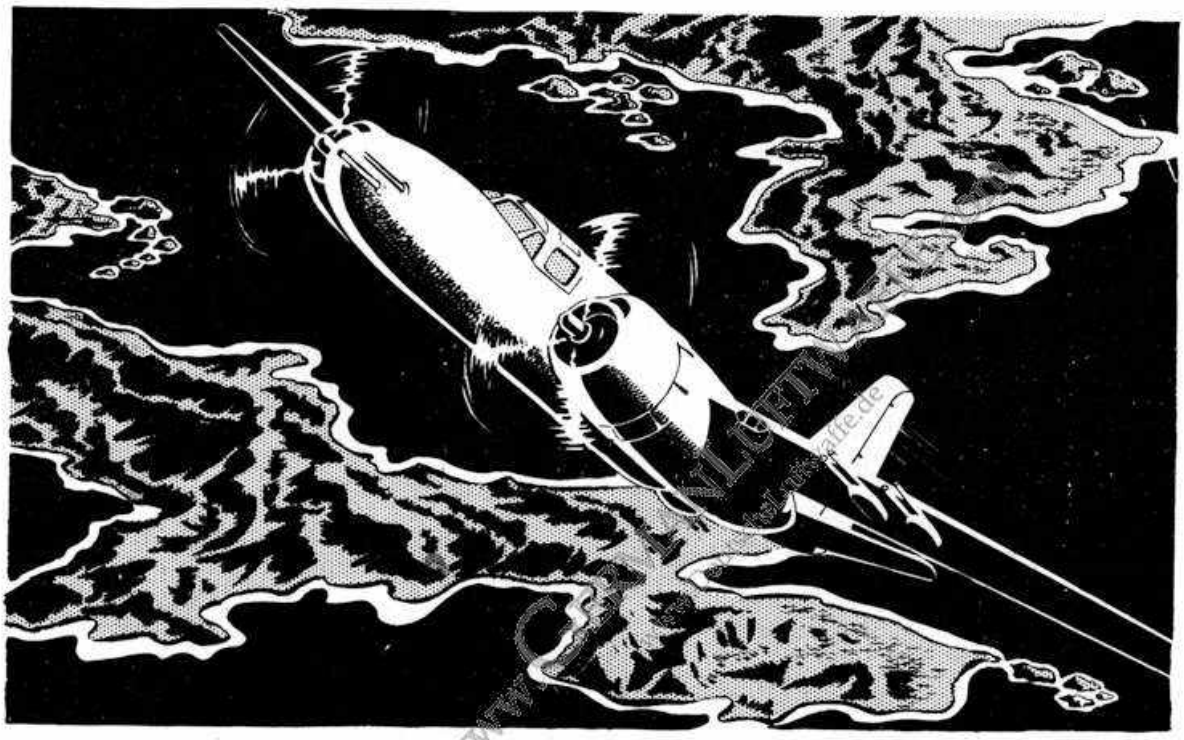
k. Surface control lock lever *(2, figure 17)*—"LOCK" position.

l. Parking brake control *(11, figure 21)*—"LOCK" position.

CAUTION

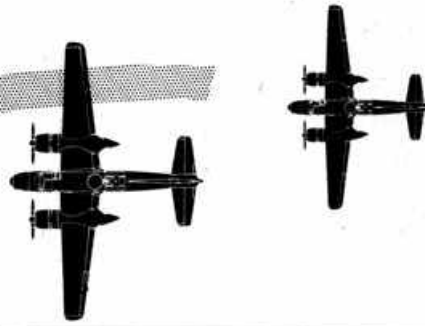
Do not set parking brake control if brakes are hot.

m. Throttle lever lock control *(12, figure 17)*—Locked position.



SECTION III
FLIGHT OPERATION DATA

AIRSPEED INSTALLATION CORRECTION TABLE	
AIRPLANES WITH KOLLSMAN PITOT-STATIC TUBE ON VERTICAL STABILIZER **EARLY AIRPLANES**	
I. A. S. (MPH)	**CORRECTION (MPH)**
FLAPS RETRACTED	
125	Subtract 2
150	Add 2
175	Add 3
200	Add 5
225	Add 7
250	Add 9
275	Add 12
300	Add 14
325	Add 16
FLAPS FULLY EXTENDED	
90	Add 3
100	Add 4
110	Add 3



AIRSPEED INSTALLATION CORRECTION TABLE	
AIRPLANES WITH PIONEER PITOT-STATIC TUBE ON VERTICAL STABILIZER **INTERMEDIATE AIRPLANES**	
I. A. S. (MPH)	**CORRECTION (MPH)**
FLAPS RETRACTED	
125	Subtract 5
150	Subtract 4
175	Subtract 3
200	Subtract 2
225	Subtract 1
250	Subtract 1
275	None
300	None
325	Add 1
FLAPS FULLY EXTENDED	
100	Subtract 6
110	Subtract 3
120	None
130	Add 2
140	Add 4
150	Add 4

AIRSPEED INSTALLATION CORRECTION TABLE	
AIRPLANES WITH NOSE IMPACT & FUSELAGE STATIC ORIFICES **LATE AIRPLANES**	
I. A. S. (MPH)	**CORRECTION (MPH)**
FLAPS RETRACTED	
125	Add 4
150	Add 3
175	Add 3
200	Add 2
225	Add 2
250	Add 2
275	Add 3
300	Add 3
325	Add 3
FLAPS FULLY EXTENDED	
100	Subtract 2
110	Subtract 3
120	Subtract 3
130	Subtract 4
140	Subtract 5
150	Subtract 6

Figure 24—Airspeed Correction Tables

POWER PLANT CHART

CARBURETORS PT-13G1 PT-13G5

AIRCRAFT MODEL(S)
A-26B & A-26C

PROPELLER(S)
HAMILTON STANDARD
6359A-18

ENGINE MODEL(S)
P. & W. R-2800-27 & -71
P. & W. R-2800-79 (WAR EMERGENCY WATER INJECTION)

GAUGE READING	FUEL PRESS. NO WATER	FUEL PRESS. WITH WATER	OIL PRESS.	OIL TEMP	CARB. AIR TEMP.	
DESIRED MAXIMUM	16-18 19	22-24 25	70-80 100	60-85°C 100°C	15-32°C 38°C	
MINIMUM IDLING	14 9	14 9	50 25 MIN.	40°C		

MAXIMUM PERMISSIBLE DIVING RPM: 2980
MINIMUM RECOMMENDED CRUISE RPM: 1500

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

WAR EMERGENCY (WET) (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
5 MINUTES			5 MINUTES			TIME LIMIT			UNLIMITED			UNLIMITED		
260°C			260°C			MAX. CYL. HD. TEMP.			232°C			232°C		
AUTO RICH			AUTO RICH			MIXTURE			AUTO RICH			AUTO LEAN		
2700			2700			R. P. M.			2400			2100		
MANIF. PRESS.	SUPER-CHARGER	FUEL (1) Gal/Min	MANIF. PRESS.	SUPER-CHARGER	FUEL (1) Gal/Min	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER (2)	FUEL GPH	MANIF. PRESS.	SUPER-CHARGER	FUEL (2) GPH
WITH WATER INJECTION ONLY						-55.0	40,000 FT.	-67.0						
						-55.0	38,000 FT.	-67.0						
						-55.0	36,000 FT.	-67.0						
						-52.4	34,000 FT.	-62.3						
						-48.4	32,000 FT.	-55.1						
						-44.4	30,000 FT.	-48.0						
F.T.	HIGH	2	F.T.	HIGH	1.5	-40.5	28,000 FT.	-40.9	F.T.	HIGH	78	F.T.	HIGH	60
F.T.	HIGH	2	F.T.	HIGH	2	-36.5	26,000 FT.	-33.7	F.T.	HIGH	88	F.T.	HIGH	64
F.T.	HIGH	2	F.T.	HIGH	2	-32.5	24,000 FT.	-26.5	F.T.	HIGH	102	F.T.	HIGH	69
F.T	HIGH	2.5	F.T.	HIGH	2.5	-28.6	22,000 FT.	-19.4	F.T.	HIGH	120	F.T.	HIGH	75
F.T.	HIGH	2.5	F.T.	HIGH	3	-24.6	20,000 FT.	-12.3	F.T.	HIGH	143	F.T.	HIGH	80
F.T.	HIGH	3	F.T.	HIGH	3.5	-20.7	18,000 FT.	- 5.2	F.T.	HIGH	170	33	HIGH	86
F.T.	HIGH	3	F.T.	HIGH	4	-16.7	16,000 FT.	2.0	F.T.	HIGH	204	33	HIGH	86
F.T.	HIGH	3.5	47	HIGH	4.5	-12.7	14,000 FT.	9.1	42	HIGH	211	33	HIGH	86
F.T.	HIGH	3.5	47	HIGH	4.5	- 8.8	12,000 FT.	16.2	42	HIGH	205	F.T.	LOW	90
F.T.	HIGH	4	F.T.	LOW	3.5	- 4.8	10,000 FT.	23.4	42	HIGH	198	33	LOW	95
F.T.	LOW	3	F.T.	LOW	4	- 0.8	8,000 FT.	30.5	F.T.	LOW	180	33	LOW	93
F.T.	LOW	3.5	F.T.	LOW	4.5	3.1	6,000 FT.	37.6	42	LOW	195	33	LOW	90
F.T.	LOW	3.5	52	LOW	4.5	7.1	4,000 FT.	44.7	42	LOW	190	33	LOW	86
F.T.	LOW	4	52	LOW	4.5	11.0	2,000 FT.	51.8	42	LOW	187	33	LOW	83
F.T.	LOW	4	52	LOW	4.5	15.0	SEA LEVEL	59.0	42	LOW	185	33	LOW	79

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.

TAKE-OFF CONDITIONS:
2700 RPM, 52 IN. HG. M.P., AUTO RICH

CONDITIONS TO AVOID:
GENERATOR LIMITATION RESTRICTS OPERATION BELOW 1500 RPM IN FLIGHT

SPECIAL NOTES

(1) USE FULL THROTTLE FOR TAKE-OFF ABOVE 1600 FT.

(2) ON ENGINES EQUIPPED WITH WATER INJECTION DO NOT USE HIGH BLOWER BELOW 10,000 FT. WITH WAR EMERGENCY POWER.

AAFMC-526
8-1-44

DATA AS OF 9 OCT. 1944 BASED ON FLIGHT TESTS

Figure 25 — Power Plant Chart

SUCTION
(RED LINE) 3.50
(GREEN ARC) 3.5 — 4.75
(RED LINE) 4.75

PNEUMATIC GUN CHARGER PRESSURE
(GREEN ARC) 400—1375
(RED LINE) 1400

HYDRAULIC PRESSURE
(GREEN ARC) 750 — 1000
(RED LINE) 1200

DE-ICING PRESSURE
(GREEN ARC) 8 — 10
(RED LINE) 10

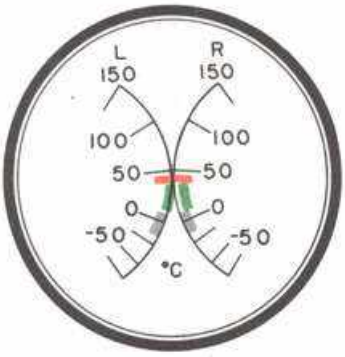
MANIFOLD PRESSURE
(BLUE ARC) 23.0 — 33.0
(GREEN ARC) 33.0 — 42.5
(SHORT RED LINE) 52.0

TACHOMETER
(BLUE ARC) 1500 — 2100
(GREEN ARC) 2100 — 2400
(RED LINE) 2700

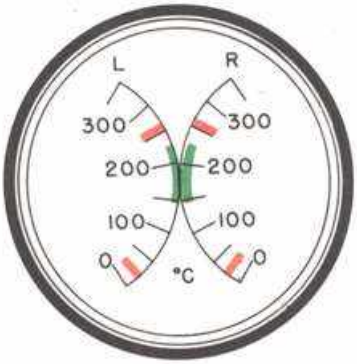
AIRSPEED
(YELLOW LINE) 208
(RED LINE) 420

FUEL PRESSURE
(RED LINE) 14
(GREEN ARC) 16-18 (WITHOUT WATER INJECTION)
(GREEN ARC) 22-24 (WITH WATER INJECTION)
(RED LINE) 25

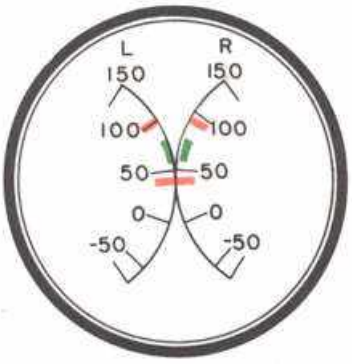
OIL PRESSURE
(RED LINE) 50
(GREEN ARC) 70 — 80
(RED LINE) 100



CARBURETOR AIR TEMPERATURE
(YELLOW ARC) —10°C TO +15°C
(GREEN ARC) +15°C TO +32°C
(RED LINE)38°C



CYLINDER HEAD TEMPERATURE
(RED LINE) 25°C
(GREEN ARC) 150° — 232°C
(RED LINE) 260°C



OIL TEMPERATURE
(RED LINE) 40°C
(GREEN ARC) 60° — 85°C
(RED LINE) 100°C

Figure 26 — Instrument Safety Range and Danger Markers

1. DESCRIPTION.

The marking system shown in *figure 26* is an aid to more efficient cruising operation. The cardinal feature is that the system distinguishes between desired operation for Auto-Lean and Auto-Rich mixtures. The following color code is employed:

a. Blue indicates Auto-Lean.

b. Green, when used with blue, indicates Auto-Rich operation. On instruments not affected by mixture position, simply a green arc is used.

c. Yellow is a caution.

d. Red is a limit or a forbidden region of operation.

e. To aid in coordinating instruments with mixture, the Auto-Lean position on the Mixture Control Quadrant is painted blue and the Auto-Rich is green.

2. OPERATION DURING CRUISING.

a. Operate the mixture so that it is in agreement with the Manifold Pressure Gage and the Tachometer markings. Thus, if both of these instrument needles are in the blue region, Auto-Lean may be used. If both needles are in the green, Auto-Rich should be used as the maximum settings for Auto-Lean are exceeded.

b. Yellow line on Airspeed is Maximum safe speed for flaps full down.

c. Yellow on Carburetor Air Temperature Gage is region which should be avoided during icing condition.

SECTION IV
EMERGENCY OPERATING INSTRUCTIONS

1. EMERGENCY ESCAPE.

(Figure 27.)

a. EXITS.

(1) PILOT'S EMERGENCY EXIT.—The pilot's enclosure doors are provided with an emergency release handle *(9, figure 28)*. When this handle is pulled it unlatches the door at the same time pulling the pins from the hinges. Push the doors out slightly to allow the air to carry them away. Exit can also be made through the bomb bay, by passing through the floor hatch in the right rear section of the compartment, providing radio equipment installed does not prevent opening of this hatch.

(2) GUNNER'S EMERGENCY EXIT.—Emergency exit can be made through the gunner's escape hatch at the top of the compartment by pulling the emergency release handle *(17, figure 27)*. The turret guns must not be in the direct aft position or the hatch will not fall free of the airplane. In flight the gunner should exit through the bomb bay *(figure 27)* whenever possible because of the danger of hitting the tail surfaces if escape hatch is used. On some airplanes, a bomb bay emergency exit switch is installed in the gunner's compartment. If it is necessary to clear the bomb bay, place the switch in the "ON" position. The bomb bay doors will open and the bombs will be released. On late airplanes a plexiglass escape hatch is provided on the right-hand side of the fuselage where the camera door is located. An emergency release handle *(17, figure 28)* is plainly stenciled and painted red.

(3) BOMBARDIER'S EMERGENCY EXIT. — The bombardier should exit through the closest door —the top entrance hatch from the pilot's compartment and the bottom entrance hatch in the nose compartment. In the latter case, the propellers should be feathered and the landing gear retracted.

b. PILOT (AND BOMBARDIER) BAIL-OUT PROCEDURE.

(1) Call crew on interphone to "Adjust parachute and stand by." Have each crew member repeat the call to prevent misunderstanding.

(2) Switch on emergency IFF radio transmitter (under green cover guard).

(3) Gain as much altitude as possible and slow airplane down.

(4) Feather propellers (to prevent possible injury to bombardier if he bails out through the nose exit).

(5) If time permits trim airplane for steady glide.

(6) Call bombardier to "bail out" (if he is going to use nose entrance hatch).

(7) Open bomb bay doors and salvo bombs.

(8) Slide seat back.

(9) Call gunner to "bail out."

(10) Release upper escape hatch by pulling emergency release lever. Keep head down to prevent being hit by side braces on hatch.

(11) Release safety belt (hold on firmly while climbing out of seat to prevent being blown out prematurely by wind blast).

(12) On some airplanes using the flat type hatch, dive flat and head first onto the right wing. *See figure 27.* On other airplanes using the clam-shell type canopy, escape may be made from either side of the compartment. On airplanes using the clam-shell type canopy attempt to go under the leading edge of the wing when bailing out.

c. ALARM BELL.—An emergency alarm bell is installed in the gunner's and bombardier's compartments. The bells are controlled by a switch *(22, figure 28)* in the pilot's compartment.

2. FIRE.

a. ENGINE FIRES. — On late airplanes a fire extinguishing system is provided. Red indicator lights which indicate fire in the engine section may be installed on the pilot's electrical control panel. In case of an engine fire, if altitude and other conditions permit, proceed as follows:

(1) Cowl flaps switch *(3, figure 18)*—"OPEN."

(2) Fuel tank selector valve control *(5 and 6, figure 18)* and fuel booster pump switch for the engine afire—"OFF."

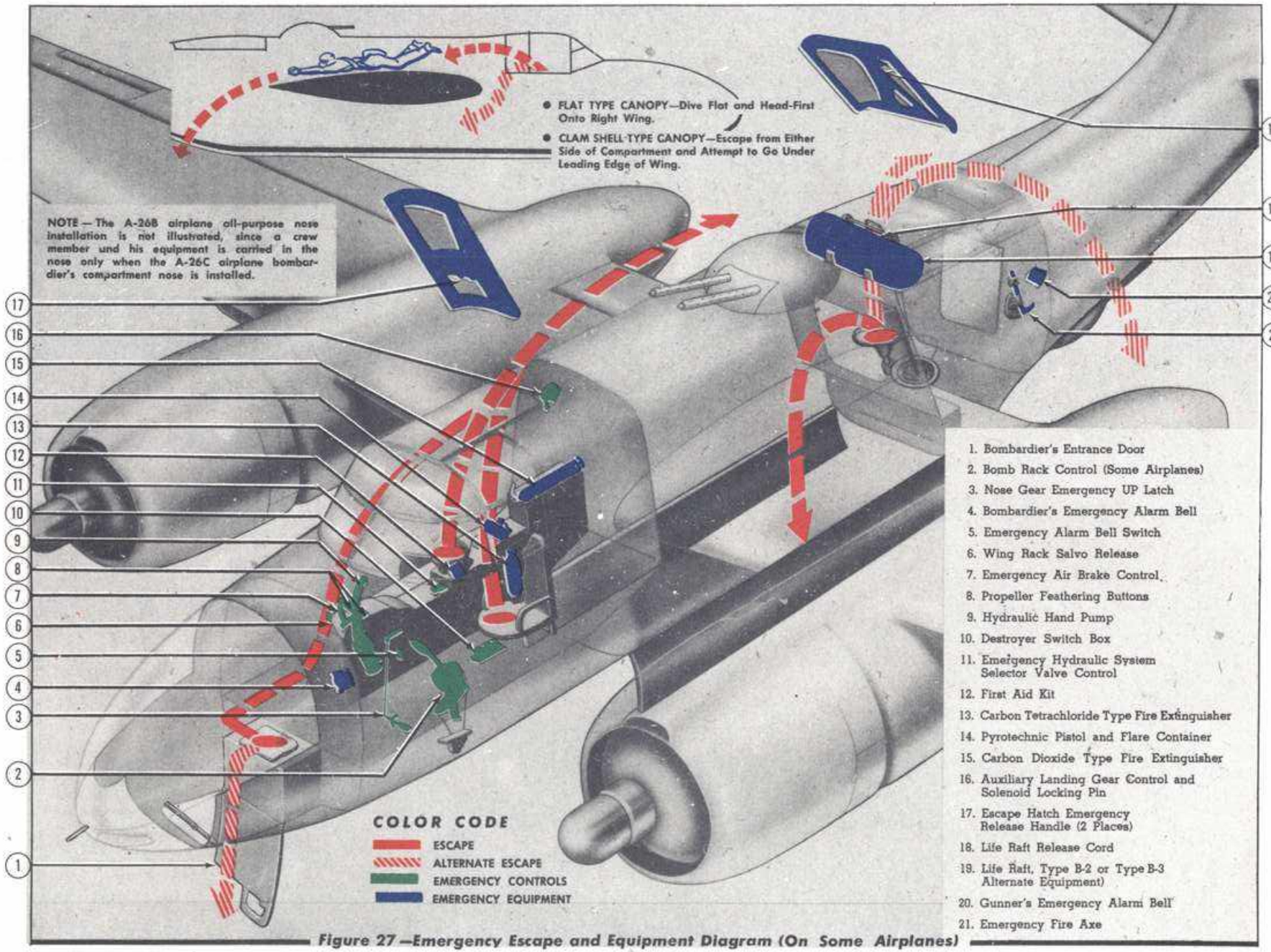
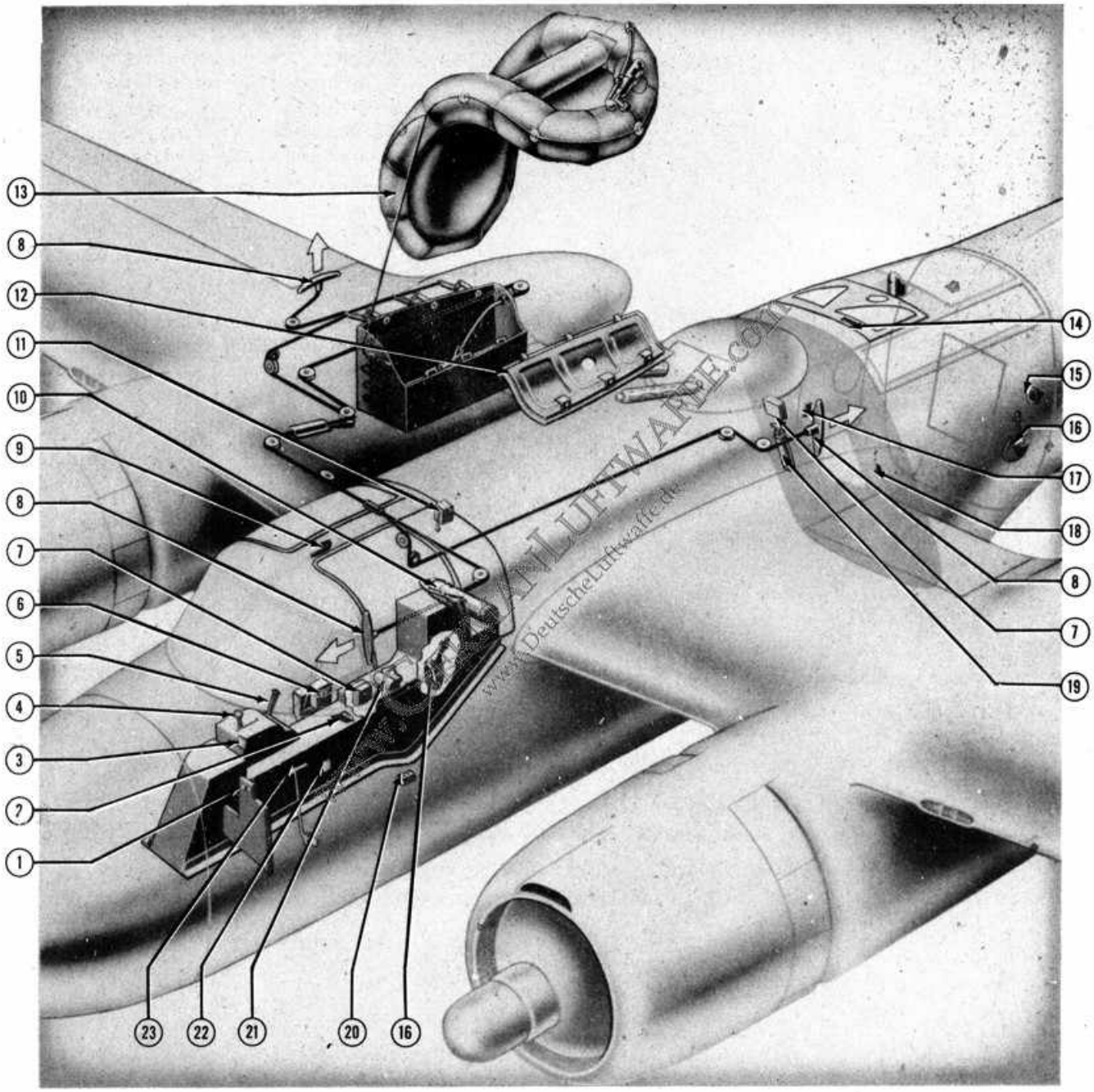


Figure 27—Emergency Escape and Equipment Diagram (On Some Airplanes)



1. Propeller Feathering Buttons
2. Emergency Hydraulic System Selector Valve
3. Wing Salvo Release Switch
4. Emergency Airbrake Control
5. Hydraulic Hand Pump
6. Engine Fire Extinguisher System Control Switches
7. First Aid Kit (2 Places)
8. Life Raft Ejection Handle (3 Places)
9. Clam Shell Type Enclosure Emergency Release
10. Carbon Dioxide Type Fire Extinguisher
11. Aux. Landing Gear Control and Solenoid Locking Pin
12. Life Raft Nacelle Compartment Assembly
13. Type A-3 Life Raft
14. Gunner's Overhead Exit Emergency Release
15. Gunner's Emergency Alarm Bell
16. Emergency Fire Axe (2 Places)
17. Gunner's Side Exit Emergency Release
18. Gunner's Bomb Bay Emergency Exit Switch
19. Carbon Tetrachloride Type Fire Extinguisher
20. Destroyer Switch Box
21. Pyrotechnic Pistol and Flare Container
22. Emergency Alarm Bell Switch
23. Nose Gear Emergency Uplatch

Figure 28 —Emergency Equipment Diagram (On Other Airplanes)

(3) Engine and hydraulic oil shut-off switch *(15, figure 18)* (if installed) "CLOSE" position.

(4) Bomb bay fuel cross-feed valve control — "OFF."

(5) Feather the propeller.

(6) Engine ignition switch—"OFF" position.

(7) Release carbon dioxide charge (if installed) to engine afire.

(8) Lower landing gear.

(9) Do not attempt to start the engine again.

(10) Open emergency exits.

(11) Land as soon as possible in order to determine the cause of the fire and correct the condition before continuing the flight.

(12) If the fire cannot be controlled, abandon the airplane.

b. WING FIRES.

(1) If a fire occurs in a wing at night, turn the switches which control the lights within the wing to "OFF" positions.

(2) Attempt to extinguish the fire by side-slipping the airplane away from the wing which is afire.

(3) If the fire cannot be extinguished, abandon the airplane.

c. FUSELAGE FIRES.

(1) Utilize the hand fire extinguishers *(13 and 15, figure 27; and 10 and 19, figure 28)* provided.

(2) Close all windows and ventilators.

(3) If the fire is due to an electrical short-circuit, turn the generator and battery switches "OFF." If the fire is due to a leaking fuel line, turn the applicable fuel selector valves and booster pump switches "OFF."

(4) If the fire cannot be brought under control, abandon the airplane.

d. FIRE EXTINGUISHERS.—A carbon tetrachloride type fire extinguisher is located in the nose wheel, and a carbon dioxide type fire extinguisher is provided in the pilot's compartment. On some airplanes the carbon dioxide type extinguisher is mounted in a bracket aft of the pilot's seat and the carbon tetrachloride type extinguisher is located on the right-hand side of the forward bulkhead in the gunner's compartment. The latter extinguisher can be obtained by persons outside the airplane by removing the right-hand camera door. An exterior latch is provided on the door for this purpose.

3. ENGINE FAILURE DURING FLIGHT.

a. ENGINE FAILURE.—Refer to Section II, paragraph 11 for sequence of procedure to be followed.

b. LANDING WITH ONE ENGINE INOPERATIVE.—It is recommended that during single engine landings the propeller of the failing engine be feathered *only* if the engine is entirely useless. If the engine can be operated at reduced power—even though a drop in oil pressure or engine roughness is present —operate the engine at reduced power during landing.

(1) PRELIMINARY APPROACH.

(a) Extend the landing gear before descending.

Note

With only one engine-driven hydraulic pump operative, a longer period of time is required to extend the landing gear.

(b) Set the propeller control for 2400 rpm and maintain a minimum airspeed of 140 mph. Turns may be made in either direction as long as flying speed and control is maintained. Make the approach at a higher altitude than usual to allow the operative engine to be "throttled down" and the rudder trim tab to be straightened.

(2) FINAL APPROACH.

(a) Do not lower the wing flaps until confident the airplane will reach the landing field without engine power.

(b) Adjust the rudder trim tab control *(7, figure 18)* as necessary during approach.

4. EMERGENCY FUEL CONSUMPTION.

If it is necessary to use excess fuel in an emergency, proceed as follows:

a. Mixture control—"EMERG. RICH."

b. Fuel booster pumps—"HIGH BOOST."

c. Propeller controls—"INCREASE" rpm.

d. Throttle controls—"OPEN" to rated power.

WARNING

This procedure will give maximum fuel consumption, but the cylinder head temperatures and manifold pressures must be kept within the limits of the Power Plant Chart *(figure 25)*.

5. BOMB BAY DOOR EMERGENCY OPERATION.

a. AIRPLANES HAVING MECHANICALLY CONTROLLED BOMB BAY DOORS AND RACKS.

(1) TO OPEN BOMB BAY DOORS.

(a) Bomb rack control lever *(figure 37)*—"DOORS OPEN" position. (Plunger on top of handle must first be depressed.)

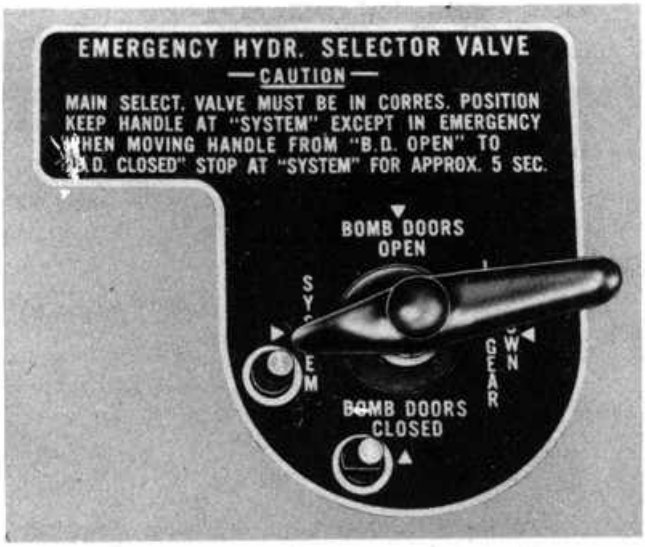


Figure 29—Emergency Hydraulic Selector Valve Control

(b) Emergency hydraulic selector valve control *(figure 29)*—"BOMB DOORS OPEN" position.

(c) Hydraulic hand pump *(16, figure 17)*—Actuate until the bomb bay doors are open and indicator lamp lights.

(d) Emergency hydraulic selector valve control —"SYSTEM" position after bomb bay doors are open.

(2) TO CLOSE BOMB BAY DOORS.

(a) Bomb rack control lever—"DOORS CLOSE" position.

(b) Emergency hydraulic selector valve control —"BOMB DOORS CLOSE" position.

(c) Hydraulic hand pump—Actuate until the bomb bay doors are locked and indicator lamp lights.

(d) Emergency hydraulic selector valve control —"SYSTEM" position after the bomb bay doors are CLOSED.

b. AIRPLANES HAVING ELECTRICALLY CONTROLLED BOMB BAY DOORS AND RACKS.

(1) TO OPEN BOMB BAY DOORS.

(a) Bomb bay circuit main power switch—"ON."

(b) Bomb bay doors selector switch *(figure 9)*—"OPEN."

(c) If the bomb bay doors do not open, move the emergency bomb door manual control *(18, figure 22)* to the "OPEN" position.

(d) If the bomb bay doors still do not open, move the emergency hydraulic selector valve control *(figure 29)* to "BOMB DOORS OPEN" position and actuate the hand pump.

(2) TO CLOSE BOMB BAY DOORS.

(a) Bomb bay circuit main power switch "ON."

(b) Bomb bay doors selector switch "DOORS CLOSE" position.

(c) If the bomb bay doors do not close, move the emergency bomb door manual control to the "CLOSE" position.

(d) If the bomb bay doors still do not close, move the emergency hydraulic selector valve control to the "BOMB DOORS CLOSED" position and actuate the hydraulic hand pump.

(e) Emergency hydraulic selector valve control "SYSTEM" position after the bomb bay doors are closed.

6. BOMB EMERGENCY RELEASE.

a. ELECTRICAL SALVO.—On some airplanes only the load on the wing bomb racks can be electrically salvoed. This is accomplished by moving the guarded wing rack salvo switch *(figure 8)* on the pilot's auxiliary control panel to the "SALVO" position. (Bomb circuit switch must be in the "WINGS AND FUS." position.)

b. MANUAL SALVO.—On some airplanes it is necessary to manually salvo the bombs in the bomb bay as follows:

(1) Bomb rack control lever *(figure 37)*—"BOMB DOORS OPEN" position.

(2) Bomb rack control lever—"SALVO" position as soon as the bomb bay doors open and indicator lamp lights.

c. AUTOMATIC SALVO.—On some airplanes the bomb bay doors are automatically opened and the bombs released by the following method:

(1) Pilot's *(figure 9)* or bombardier's bomb arming switch *(11, figure 52)*—Set to the desired position —"OFF," "TAIL," or "NOSE AND TAIL."

(2) Pilot's *(figure 9)* or bombardier's salvo control *(11, figure 52)*—"SALVO" position.

Note

This operation will salvo all the wing and fuselage bombs (demolition). If fragmentation bombs are carried, the fragmentation "SELECTIVE-TRAIN" switches must be in the "TRAIN" position and the bomb release switch on the pilot's control wheel held in the DOWN position to salvo the bombs.

7. WING FLAPS EMERGENCY OPERATION.

On some airplanes the emergency extension or retraction of the wing flaps is accomplished by manually rotating the emergency hand-crank (located on the gunner's forward bulk-head to the right of the entrance door. To fully extend or retract the wing flaps, turn the crank 360 revolutions. A flaps position indicator is installed adjacent to this handcrank.

8. LANDING GEAR EMERGENCY OPERATION.

a. MAIN LANDING GEAR.

(1) Landing gear valve control lever *(5, figure 17)*—"DOWN."

(2) Emergency hydraulic selector valve control *(figure 29)*—"LANDING GEAR DOWN" position.

(3) Actuate the hydraulic hand pump *(16, figure 17)*.

(4) As soon as the landing gear is extended and locked, as indicated by position lights and position indicator, move the emergency hydraulic selector valve control to the "SYSTEM" position.

b. NOSE GEAR.—In case the nose wheel fails to extend, it can be mechanically released by pulling the emergency release control *(figure 30)*. This will permit the nose gear to be hydraulically extended by repeating the process in preceding paragraph 8. *a.*, in this section.

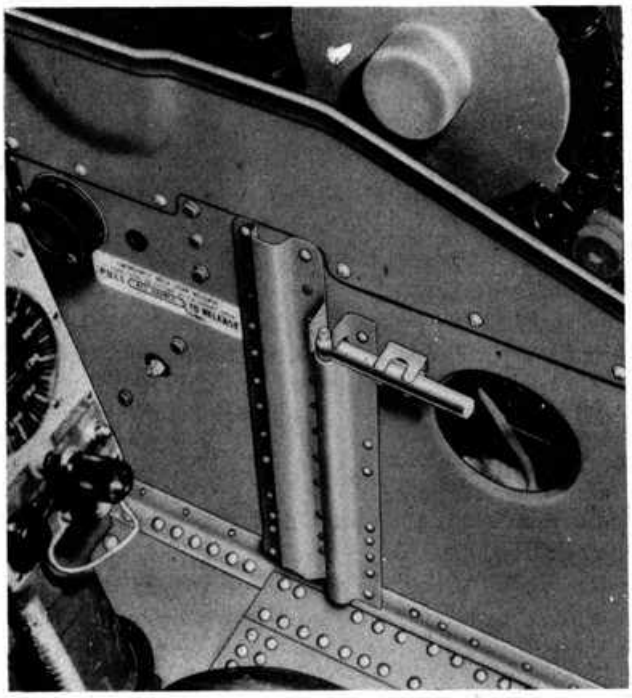


Figure 30—Nose Wheel Emergency Release Lever

9. BRAKE EMERGENCY OPERATION.

a. If normal hydraulic system pressure failure is the cause, operate the hydraulic hand pump. Back pressure will be felt at the brake pedals if no serious leaks in the brake line are present.

b. The emergency air brakes should be used only as a "last resort" method of stopping the airplane. Use the following method:

(1) Prepare to land at the available landing field that has the longest runway.

(2) To apply the brakes, pull the emergency air brake lever *(1, figure 17)* aft.

CAUTION

When using the emergency air brake system, both brakes are applied at once; selective control is not possible. The air pressure supply is sufficient to apply and release the brakes at least three times.

(3) To release the brakes, return the emergency air brake lever to the "RELEASE" position.

CAUTION

If the air lines as well as the hydraulic lines are punctured or damaged, no brake pressure will be available. The airplane cannot be stopped once it is on the ground unless there is a long landing area. Do not attempt to swing the airplane by the engines to avoid obstacles, as this will result in a considerable increase in speed. The pilot should decide before landing whether or not enough space is available to make a landing without brakes. If it is felt that the landing space is insufficient to stop the roll of the airplane—even by applying full "UP" elevator and dragging the tail on the ground—do not lower landing gear. Make a belly landing.

10. LANDING WITH WHEELS RETRACTED.

a. PILOT PROCEDURE.

(1) PREPARATORY TO LANDING.

(a) Call crew—"Prepare for crash landing" and have crew acknowledge.

(b) Switch on emergency IFF radio transmitter.

(c) Remove parachute.

(d) Tighten safety belt and lock shoulder harness.

(e) Have crew members assume body postures at the crew ditching stations as shown in *figure 31*.

(f) Salvo bombs and close bomb bay doors.

CAUTION

Bomb bay doors must be closed.

(g) Slide seat back but maintain rudder control. (Place cushion between chest and control column.)

(h) Have bombardier pull emergency hatch release immediately prior to landing.

(i) Mixture controls to "Idle Cut-Off."

(j) Battery, and master ignition switches to "OFF."

(k) Oil and Hydraulic shut-off switches to "OFF."

(l) Tank selector valves to "OFF."

(2) LANDING.

(a) Land as nearly into the wind as possible, never over 90 degrees from the wind.

(b) Lower wing flaps to the "FULL DOWN" ("LANDING") position, to reduce contacting speed.

(c) Maintain adequate air speed for full control until airplane is on the ground. Do not attempt to turn at slow speed as a stall may result.

b. REAR GUNNER.

(1) Lock upper turret guns in aft position at 45 degree angle.

(2) Lock sighting station in aft position.

(3) Release upper escape hatch by pulling emergency release handle.

(4) Remove parachute.

(5) Sit on floor facing aft in right forward corner of the compartment with back firmly against sloping bulkhead. Place parachute or cushion between head and bulkhead.

(6) Brace self with hands and feet.

(7) Keep earphone on for pilot warning of impact.

(8) Exit through upper escape hatch.

c. BOMBARDIER.

(1) Take position on jump seat beside pilot. Be sure seat is firmly locked in place.

(2) Remove parachute.

(3) Fasten and tighten safety belt.

(4) Pull upper emergency escape hatch release on signal from pilot.

(5) Lean well forward with hands behind head. Use cushion to protect head and face.

(6) Exit through upper hatch opening.

11. LANDING IN WATER (DITCHING)

a. PREPARATION FOR DITCHING.

(1) If possible use up most of the fuel supply to lighten the airplane and reduce stalling speed. Make sure enough fuel is left to maintain power and control during final approach.

(2) Have crew members jettison loose equipment to further lighten airplane. Salvo bombs and fuel tanks, close bomb bay doors and be sure landing gear is retracted. Jettison hatches.

(3) If it is dark, turn on the formation lights *(figure 11)*, and the landing lamps *(figure 11)* provided the reflection does not impair landing vision. Turn off all bright lights within the fuselage to accustom the eyes to darkness. Partially inflate the life jacket with one or two breaths. The life jacket shall be completely inflated after passing through the escape hatch.

b. DITCHING THE AIRPLANE.

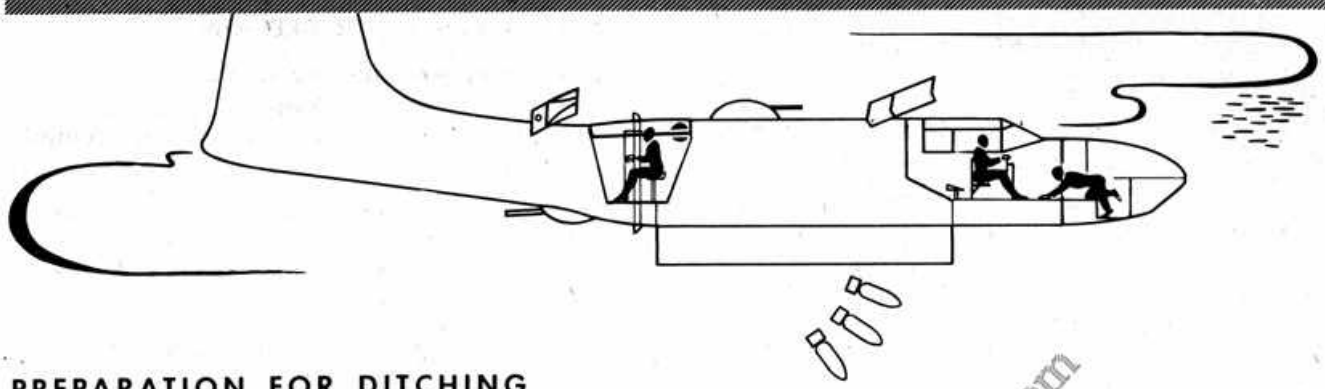
(1) APPROACH.—Use from 25 degree to 38 degree flaps and make a normal approach to insure control and permit some margin of speed after leveling off. Power should be used, if available, so that the best point for ditching on a swell may be chosen. Make the approach and ditch parallel to the swells, preferably on the upslope or top of a swell. This may call for crabbing slightly if there is a crosswind. If the wind is strong (over 35 mph) land into the wind regardless of the direction or movement of the swells. If only one engine is available, a little power may be used to flatten approach, but a margin of rudder control must remain available. Immediately before ditching crew members shall assume positions shown in the "Ditching Sequence Diagram" *(figure 31)*.

(2) MAKING CONTACT.—Reduce power until all excess speed above stalling speed is lost, but do not stall the airplane. Then strike the sea with tail slightly down. There will be a slight impact as the aft fuselage section strikes the water, followed by a severe impact with sudden deceleration in most cases. If the landing has been made too fast, with tail high, a bounce may occur. As the airplane comes to rest, the nose will submerge, but if the landing was correctly accomplished, the airplane can be expected to float for about one minute.

c. IMMEDIATELY AFTER DITCHING.

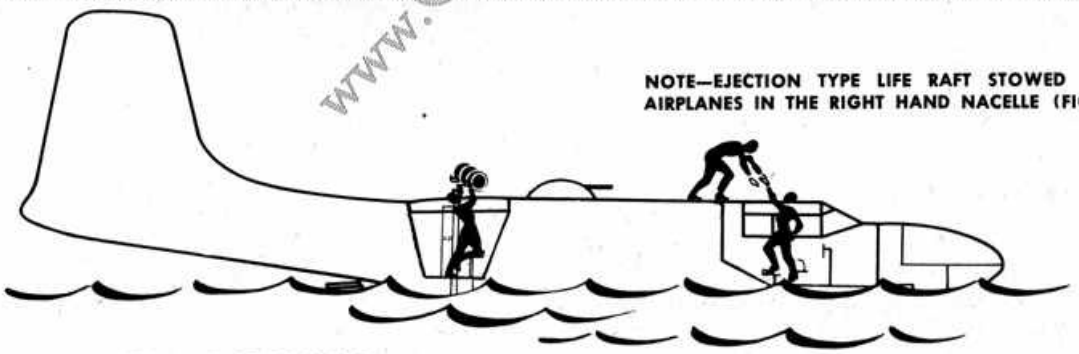
(1) After escaping through the hatches each crew member shall inflate his life jacket.

(2) The gunner shall remove the life raft from stowage by pulling the life raft emergency release cord, then hoist the raft out of the gunner's compartment, then exit through the upper emergency escape hatch. Later airplanes are equipped with a self ejecting, self inflating life raft *(figure 28)* in the right hand nacelle, which should be released immediately after



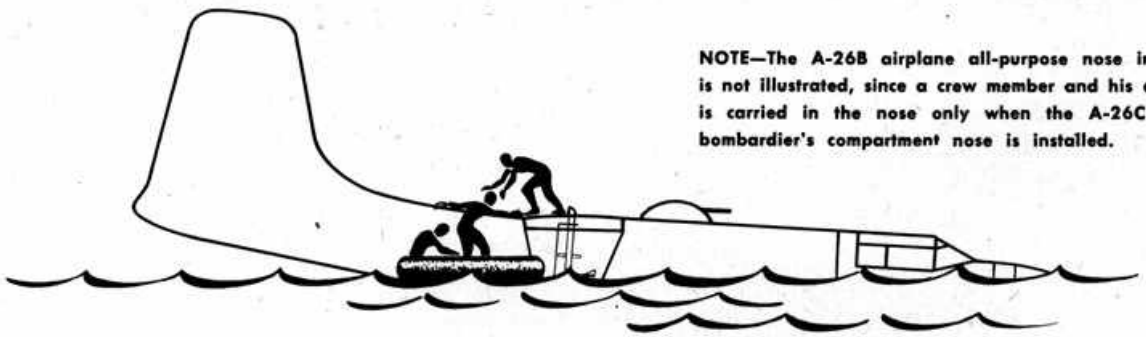
PREPARATION FOR DITCHING

APPROACH AND DITCHING



NOTE—EJECTION TYPE LIFE RAFT STOWED ON LATER AIRPLANES IN THE RIGHT HAND NACELLE (FIGURE 28)

IMMEDIATELY AFTER DITCHING



NOTE—The A-26B airplane all-purpose nose installation is not illustrated, since a crew member and his equipment is carried in the nose only when the A-26C airplane bombardier's compartment nose is installed.

BOARDING THE LIFE RAFT

Figure 31—Ditching Sequence Diagram

impact by pulling one of three pull type handles installed: one in the aft gunner's compartment on the right-hand side of the forward bulkhead; one on the right-hand side of the control pedestal in the pilot's compartment, and one recessed in the nacelle skin on top of the nacelle adjacent to the forward edge of the life raft door. A long pull on either the gunner's compartment or pilot's compartment handle releases the door locking pins and punctures the seal on the bottle valve, thus freeing the door and inflating the life raft. A static line (cord) approximately 25 feet long attached from the raft to the nacelle will prevent the life raft from drifting from the airplane, but is not strong enough to pull the raft under if the airplane sinks before this cord is cut.

d. INDIVIDUAL CREW MEMBER PROCEDURE FOR DITCHING.

(1) PILOT.

(a) Call to crew: "Prepare for ditching" and have crew acknowledge.

(b) Switch on emergency IFF radio transmitter.

(c) Unbuckle parachute.

(d) Tighten safety belt and shoulder harness.

(e) Salvo bombs. Close bomb bay doors. Be sure landing gear is retracted.

(f) Slide seat back but keep rudder control. Use cushion to protect face and chest.

(g) Call to rear gunner, "Brace for impact."

(h) Have bombardier pull emergency escape hatch release when airplane is just off the water.

(i) Exit through hatch and immediately inflate life vest. Proceed aft and assist gunner with inflating and launching of life raft.

(2) BOMBARDIER.

(a) Take position on jump seat beside pilot. Be sure seat is firmly locked in place.

(b) Remove parachute.

(c) Tighten safety belt.

(d) Pull emergency lever to release cockpit hatch on signal from pilot—just before plane strikes water.

(e) Lean well forward, hands behind head. Use cushion to protect head and face.

(f) Assist pilot from seat and exit through hatch.

(g) Inflate life vest and proceed aft.

(3) REAR GUNNER.

(a) Lock guns in forward position to prevent them from interfering with life raft removal and inflation.

(b) Lock sighting station in aft position.

(c) Release upper escape hatch.

(d) Remove parachute.

(e) Sit on floor facing aft in the right forward corner of the compartment with back against sloping bulkhead, using cushion between head and bulkhead.

(f) Brace self for impact and listen on interphone. Wait for final impact before moving from this position.

(g) Pull emergency life raft release and hoist raft from compartment; if self ejection raft is installed, raft release handle should be pulled.

(h) Exit through escape hatch, inflate life vest, and life raft.

SECTION V
OPERATIONAL EQUIPMENT

1. HEATING AND VENTILATING SYSTEMS.

a. GENERAL.—Two types of heating and ventilating systems are provided. On early airplanes a Stewart-Warner ducting and recirculating type system is used. When the bombardier's compartment nose is installed, the system controlled by the pilot supplies both the pilot's and bombardier's compartments. An intermediate series of airplanes does not have heaters installed nor provisions for heaters although some airplanes have ducting heaters only. Late airplanes may have a Surface Combustion type heating and ventilating system installed forward and aft and independent of each other. Fuel for the Surface Combustion heaters may be supplied from two sources—either the right-hand wing main fuel tank, with booster pump "ON," while the airplane is on the ground, or the carburetor, by means of the engine-driven pump, while the airplane is in flight.

Note

When the lower turret is replaced by a 125 gallon fuel tank, the aft heating system is removed.

b. OPERATION OF STEWART-WARNER SYSTEM.

Note

Operation of the Stewart-Warner type system on the ground is possible only when the right-hand engine is operative with a minimum of 25 inches hg.

(1) PILOT'S CONTROLS.

(a) IF HEAT IS DESIRED:

1. MASTER "ON-OFF" SWITCH *(figure 9)* —"ON."

CAUTION

During take-offs and landings, in an emergency or before engaging in combat, the master switch should be in the "OFF" position.

2. HEATER CONTROL *(4, figure 17)* — Any position between "OFF" and "MAX." As the control is moved toward "MAX." position the output of the heaters is increased.

(b) IF COLD AIR IS DESIRED:

1. MASTER ON-OFF SWITCH—"ON."

2. HEATER CONTROL—"COLD AIR SETTING."

3. COLD AIR INTAKE SWITCH *(figure 9)*—"DECREASE" or "INCREASE" position.

(2) GUNNER'S CONTROLS *(14, figure 46)* — The controls for the gunner's heating and ventilating system are operated in the same manner as the pilot's controls, but are inoperative on the ground. The master "ON-OFF" switch is controlled only by the pilot.

c. OPERATION OF SURFACE COMBUSTION SYSTEM.

(1) PILOT'S CONTROLS.

(a) IF HEAT IS DESIRED:

1. MASTER "ON-OFF" SWITCH—"ON."

2. CONTROL DIAL—"LOW" or "MAX." depending on amount of heat required.

3. HEATER START SWITCH—"ON" (for 10 seconds).

Note

For ground heating, control dial must be in "LOW" position only. Right-hand booster pump "LOW BOOST."

(b) IF COLD AIR IS DESIRED—Control dial at "DECREASE" or "INCREASE."

(2) GUNNER'S CONTROLS. — The controls for the gunner's heating and ventilating system are operated in the same manner as the pilot's controls, but are inoperative on the ground. The master "ON-OFF" switch is controlled only by the pilot.

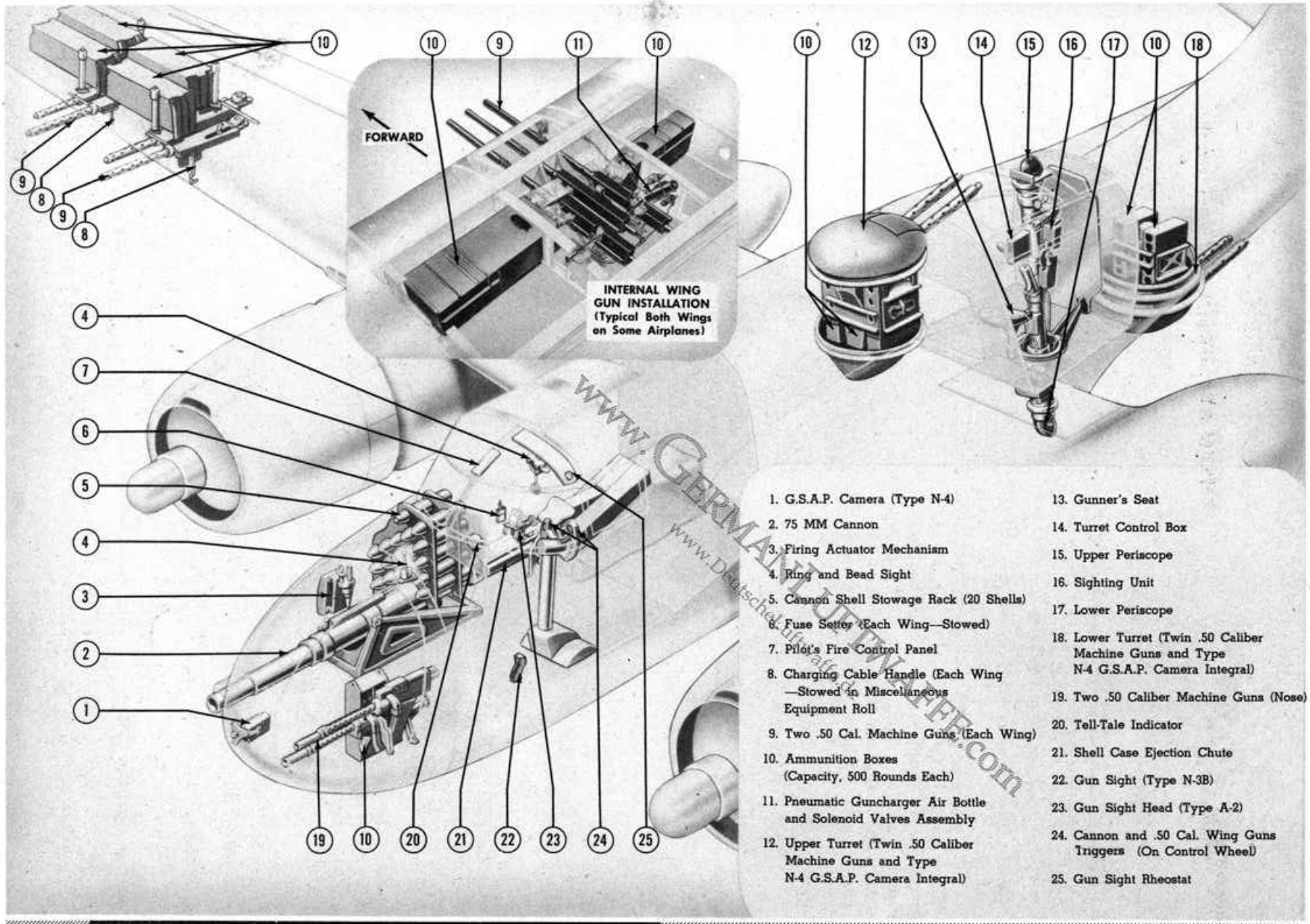


Figure 32 — Gunnery Equipment Diagram (On Some Airplanes)

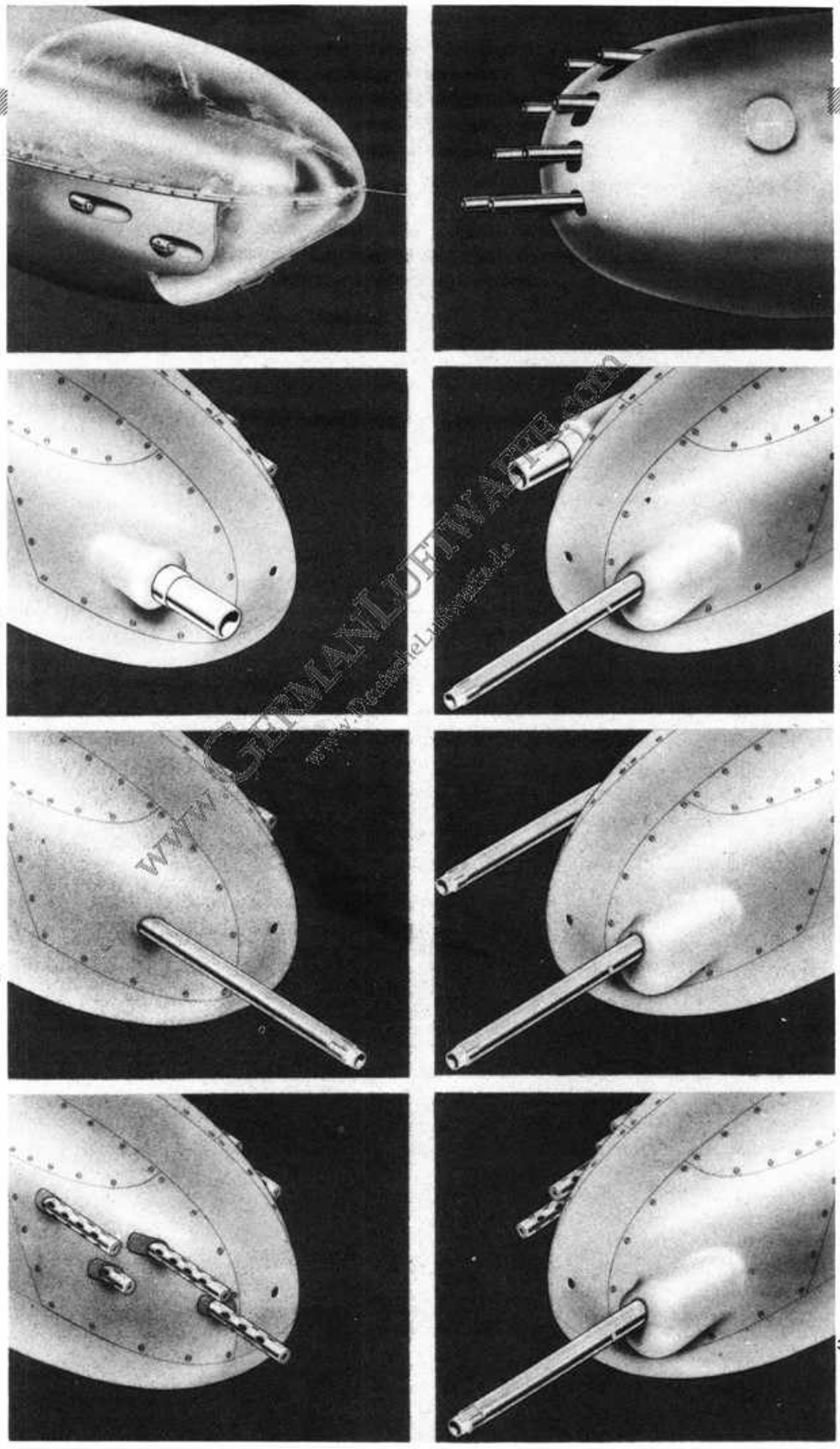


Figure 33 —Nose Installations

2. ARMAMENT.

(Figures 33, 38 and 41.)

a. GUNNERY.

(1) All airplanes carry the following gunnery equipment:

(a) Twin .50 caliber machine guns in the upper turret.

(b) Twin .50 caliber machine guns in the lower turret (if installed).

(2) There are provisions for alternate installation of the following:

(a) Either two or four fixed .50 caliber machine guns under each wing.

(b) One of the following nose gunnery installations *(figure 34):*

1. One 75 mm cannon and one 37 mm cannon.

2. One 75 mm cannon and two .50 caliber machine guns.

3. Two 37 mm cannons.

4. One 37 mm cannon and two .50 caliber machine guns.

5. One 37 mm cannon and four .50 caliber machine guns.

6. Six .50 caliber machine guns.

7. Eight .50 caliber machine guns.

8. Bombardier's compartment installation with two .50 caliber fixed machine guns.

(c) Three .50 caliber internal wing guns installed in leading edge of each wing. (When these are installed external gun packages cannot be carried.)

(d) 14 (HVAR) rockets carried under wing.

(3) All nose gunnery installations and .50 caliber wing guns are fired by the pilot. On airplanes using "flat" type pilot's canopy *(7, figure 2),* upper turret guns may be locked in "STRAIGHT FORWARD" position and fired by the pilot for strafing purposes.

b. BOMBING EQUIPMENT. *(Figure 38.)* — Provisions are made for carrying bombs below the wings and in the fuselage. Release is controlled from the pilot's compartment; manually, on early airplanes and electrically on late airplanes. The bombardier's compartment is equipped with an auxiliary set of bombing controls which operate in conjunction with the pilot's all-electric bomb release system. On modified A-26C airplanes carrying radio equipment in the forward bomb bay, the aft bomb bay is arranged to carry 2000 pounds of bombs. Racks are provided to carry two 1000 pound bombs, or four 500 pound bombs, or eight 250 pound bombs. Hooks are provided at the top of the racks so that a C-3A bomb hoist may be used.

c. CHEMICAL EQUIPMENT. *(Figure 38.)* — When the wing bomb racks are installed, chemical tanks may be carried on the four wing racks as alternate load. The chemical tanks are fired electrically by guarded switches to produce smoke. On some airplanes, the chemical release switches are located on the auxiliary electrical control panel; on other airplanes the switches are located on the main electrical control panel. The tanks may be dropped in the same manner that the wing bombs are released.

d. TORPEDO EQUIPMENT. *(Figure 41.)* — Provisions are made for the alternate installation of two Mark 13 torpedoes in the bomb bay compartment. The torpedoes are electrically or manually released by the pilot. A Type B-2 torpedo director is used by the pilot to facilitate aiming the torpedoes.

e. ROCKET EQUIPMENT. *(Figure 41.)*—Some airplanes are equipped for launching 14 five-inch (HVAR) rockets. A "bomb circuit power" (master) switch is located on the overhead fire control panel, a "Bombs-Rockets" selector switch and a "Projector Release Control" box is located on the control pedestal. The rocket or bombs firing button is located on the left-hand top side of the control wheel.

3. PHOTOGRAPHIC EQUIPMENT.

a. TYPE N-4 G.S.A.P. CAMERA.—The G.S.A.P. (gun sight aiming point) camera located in the nose section on some airplanes *(1, figure 3)* or adjacent to the anti-glare shield bracket in the pilot's compartment on other airplanes, is provided for photography under either of two conditions.

(1) PHOTOGRAPHY IN CONJUNCTION WITH THE FIRING OF THE CANNON OR .50 CALIBER MACHINE GUNS. — The master camera safety switch *(figure 10)* functions as the pilot's cannon and .50 caliber guns safety switch, as well as a means of operating the G.S.A.P. camera independently of, or in conjunction with, the firing of the cannon or .50 caliber fixed guns. The cannon and .50 caliber gun triggers are inoperative when the master camera safety switch is in the "OFF" position. The camera safety switch must be in the "GUNS & CAMERA" position before either the cannon or the .50 caliber fixed guns can be fired; therefore, at the time the cannon or the .50 caliber fixed guns are fired the camera is always operative.

(2) PHOTOGRAPHY INDEPENDENT OF THE FIRING OF THE CANNON OR .50 CALIBER MACHINE GUNS.

(a) Master camera safety switch—"CAMERA."

(b) Hold down either the cannon trigger or the .50 caliber guns trigger.

(c) Release trigger to make camera inoperative.

b. CAMERAS INTEGRAL WITH GUN TURRETS.—Each turret camera operates in conjunction with the firing of the respective turret guns. The cameras are operated by turning the "CAMERA" switch to "ON" and squeezing the turret gun trigger switch.

c. ORIENTATION CAMERA (IF INSTALLED).

(1) A mount, located in the fuselage aft section, is provided for the installation of an American Type K-24 or an English Type F-24 orientation camera.

(2) A mount, located aft and above the pilot's seat on the radio equipment forward structure, is provided for the installation of an orientation camera intervalometer. If the bombardier's compartment nose is installed, the mount is located on the left-hand side of that compartment.

(3) Two camera doors are provided in the gunner's compartment to enable the gunner to use any type hand-held camera. The camera door, located in the bomb bay compartment, is accessible to the gunner. It may also be used by the gunner to facilitate photography with a hand-held camera.

(a) PHOTOGRAPHY INDEPENDENT OF BOMBING.

1. Set the camera intervalometer as follows:

a. For single exposures or for a sequence of exposures.

b. For the desired number of exposures.

c. For the desired distance between exposures.

2. Orientation camera switch—"ON."

Note

On some airplanes the orientation camera switch *(figure 8)* and the bomb selector switch are located on the auxiliary electrical control panel. On other airplanes these switches are located on the main electrical control panel *(figure 9).*

3. Bomb selector switch *(figure 9)*—"FUS."

4. Hold down bomb release switch *(9, figure 36).*

WARNING

Bomb bay doors must be closed to prevent bomb release.

(b) PHOTOGRAPHY IN CONJUNCTION WITH BOMBING.

1. Set the camera intervalometer as follows:

a. For single exposures or for a sequence of exposures.

b. For the desired number of exposures.

c. For the desired distance between exposures.

2. Orientation camera switch—"ON."

3. Release bombs.

4. MISCELLANEOUS EQUIPMENT.

a. PILOT'S SEAT. *(26, figure 20.)*—The pilot's seat, equipped with a Type B-11 safety belt, is adjustable both vertically and horizontally to accommodate pilots of varying stature.

b. GUNLOADER'S SEAT. *(49, figure 20.)* — The gun-loader's saddle-type seat, equipped with a Type B-11 safety belt, is not adjustable.

c. NAVIGATOR'S SEAT. *(60, figure 22.)*—A folding non-adjustable navigator's seat is installed on some airplanes.

d. GUNNER'S SEAT. *(13, figure 33.)* — The gunner's seat is mounted on a circular track around the sighting unit. The seat can be rotated in either direction continuously by movement of the gunner's feet upon the compartment floor. The seat rotates independently of the sighting unit: This allows a finer control of the sighting unit. The seat is adjustable for height and can be locked in either the forward or aft position by engaging the forward-aft position lock pin assembly. A gunner's power seat drive unit is installed on some airplanes to drive the gunner's seat by means of an electrically operated motor. A lever lowers the drive shaft gear of the motor on to the ring gear when power is desired, and raises the drive shaft gear to disengage it from the ring gear. When the sighting station is turned in one direction it shifts the transmission which engages the gears and they rotate the gunner's seat to that direction. If the sighting station is turned in the opposite direction the transmission gears are shifted and the directional rotation of the gunner's seat is reversed.

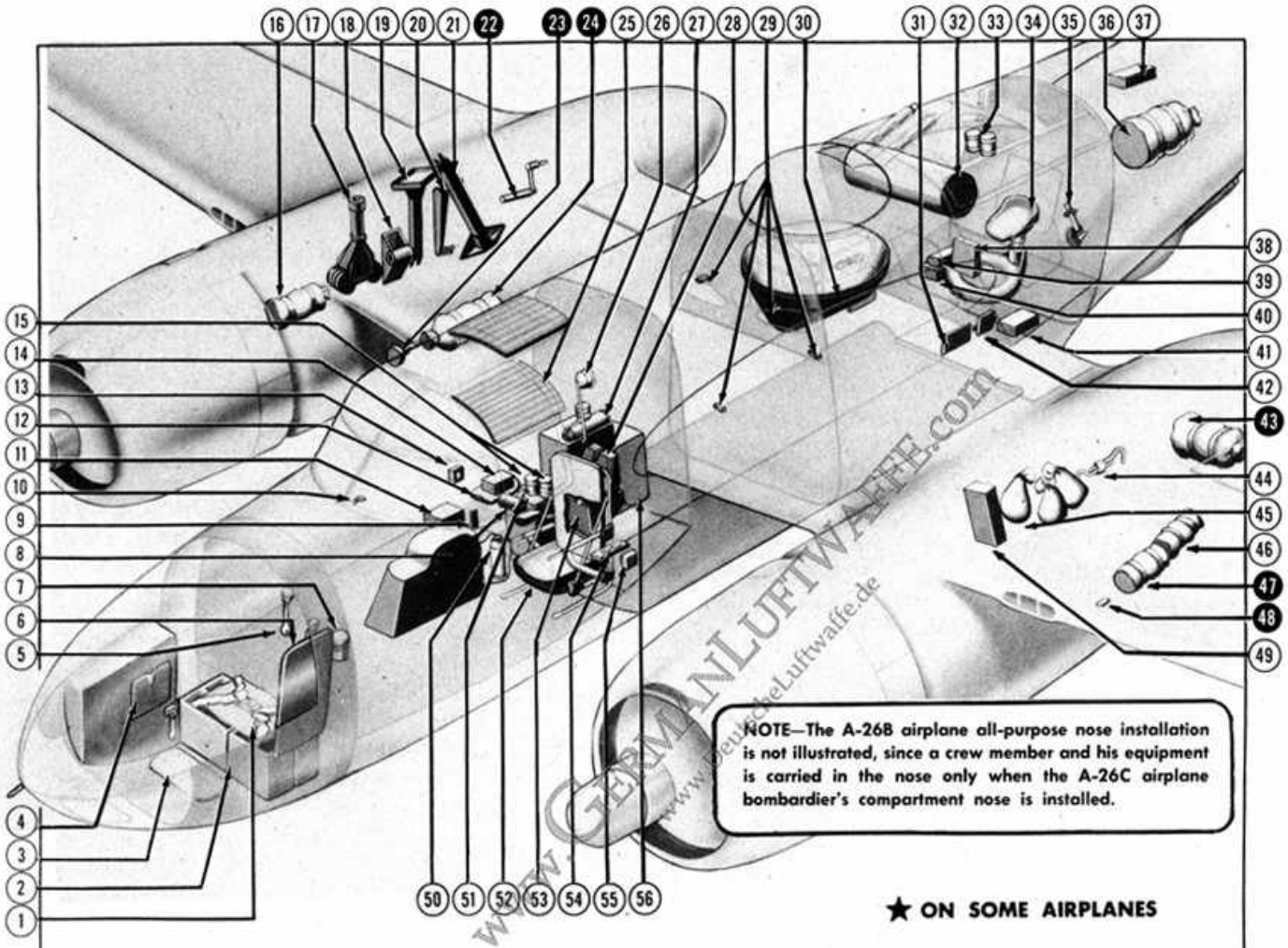
e. ADDITIONAL EQUIPMENT. — Refer to the "MISCELLANEOUS EQUIPMENT" diagram *(figure 35)* for additional equipment.

5. COMMUNICATIONS EQUIPMENT.

a. RADIO EQUIPMENT.—The radio equipment installed in the airplane is arranged as shown in *figure 32* and consists of the following sets:

(1) SCR-274-N COMMAND SET.—For airplane to airplane short range and airplane to ground operation.

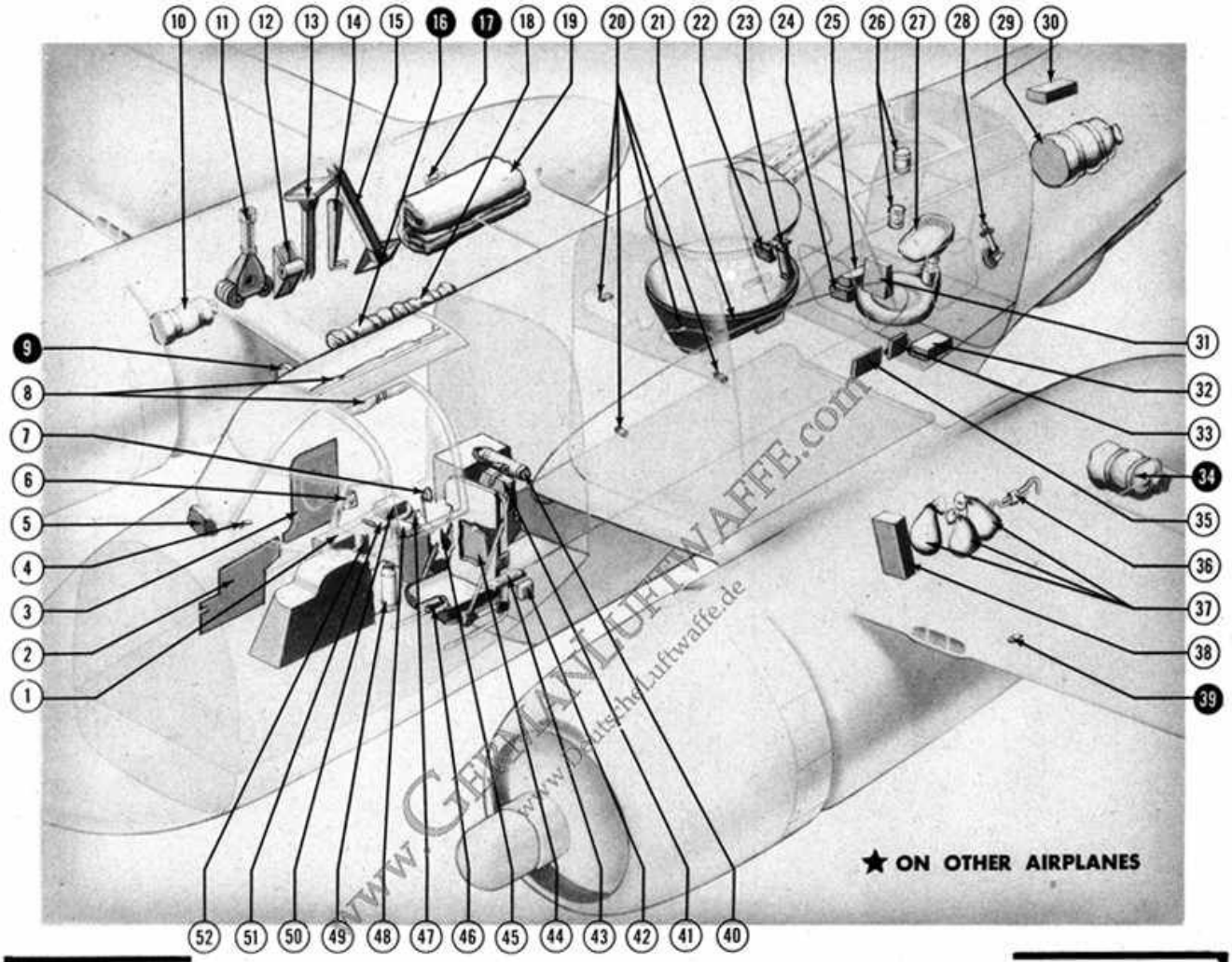
(2) SCR-595-A or SCR-695-A IDENTIFICATION EQUIPMENT.—For recognition purposes.



★ ON SOME AIRPLANES

1. Seat and Safety Belt (On Top of Ammunition Box)
2. Four Ammunition Boxes
3. Kneeling Pad
4. Data Case Holder
5. Entrance Assist Straps
6. Chart Board
7. Relief Container
8. Signal Container Assembly Type A-6
9. Load Adjuster
10. Clip Map Holder
11. Technical Orders
12. Gun Loader's Seat
13. Ash Trays
14. First Aid Kit
15. Disposable Relief Container
16. Bomb Hoist Bag Assembly Sling Stowage
17. Bomb Hoist Assembly
18. Wing Bomb Support Assembly
19. Bomb Hoist Beam Assembly
20. Bomb Hoist Handle Assemblies
21. Bomb Hoist Beam Assembly
22. Starter Hand Crank Assembly
23. Gear Box (Starting Crank)
24. Engine Tool Kit
25. Sun Curtain Assemblies
26. Hydraulic Reservoir Funnel
27. Type A-17 Fire Extinguisher
28. Pilot's Map Case and Glove Compartment
29. Bolts (Leveling Pins)
30. Bag, Ejected, Link and Case Catcher (Upper Turret)
31. Bomb Loading Diagrams
32. Life Raft
33. Disposable Crew Relief Containers
34. Gunner's Seat
35. Fireman's Small Hand Axe
36. Bomb Bay Vent Dust Excluder Assembly
37. Turret Spare Parts Kit (Type 2CSD1C1)
38. Gunner's Map Case and Glove Compartment
39. Bomb Rack Hook Assemblies
40. Bomb Hoist Pulley Bracket Assembly
41. Wing Rack Assemblies
42. Holder Bomb Loading Instruction Card
43. Engine Covers
44. Wing Gun Charging Handles
45. Outboard Wing Bomb Rack Support Assemblies (Forward and Aft)
46. Miscellaneous Handling Equipment Roll Assembly
47. Propeller Tool Kit
48. External Power Connection Adapter
49. Bomb Shackle Assemblies (Type B-7)
50. Type A-2 Fire Extinguisher
51. Pyrotechnic Pistol Type M-8
52. Pilot's Seat
53. Airplane Check List Holder
54. Airplane and Engine Data Name Plate
55. Ash Trays
56. Bag, Ejected, Link and Case Catcher (Cannon)

Figure 34 (Sheet 1 of 2)—Miscellaneous Equipment Diagram



1. Technical Orders
2. Navigator's Table (Stowed)
3. Navigator's Seat (Stowed)
4. Clip Map Holder
5. Astro Compass (Stowed)
6. Ash Trays
7. Hydraulic Reservoir Funnel
8. Sun Curtain Assemblies
9. Gear Box (Starting Crank)
10. Bomb Hoist Bag Assembly Sling Stowage
11. Bomb Hoist Assembly
12. Wing Bomb Support Assembly
13. Bomb Hoist Beam Assembly
14. Bomb Hoist Handle Assemblies
15. Bomb Hoist Beam Assembly
16. Propeller Tool Kit
17. Starter Hand Crank Assembly
18. Miscellaneous Handling Equipment Roll Assembly
19. Life Raft (Ejection Type)
20. Bolts (Leveling Pins)
21. Bay, Ejected, Link and Case Catcher (Upper Turret)
22. First Aid Kit
23. Type A-2 Fire Extinguisher
24. Bomb Hoist Pulley Bracket Assembly
25. Bomb Rack Hook Assemblies
26. Disposable Crew Relief Containers
27. Gunner's Seat
28. Fireman's Small Hand Axe
29. Bomb Bay Vent Duct Excluder Assembly
30. Turret Spare Parts Kit (Type 2CSD1C1)
31. Gunner's Map Case and Glove Compartment
32. Wing Rack Assemblies
33. Holder Bomb Loading Instruction Card
34. Engine Covers
35. Bomb Loading Diagrams
36. Wing Gun Charging Handles
37. Outboard Wing Bomb Rack Support Assemblies (Forward and Aft)
38. Bomb Shackle Assemblies (Type B-7)
39. External Power Connection Adapter
40. Type A-17 Fire Extinguisher
41. Pilot's Map Case and Glove Compartment
42. Ash Trays
43. Airplane and Engine Data Name Plate (USAAF)
44. Airplane Check List Holder
45. Fire Axe
46. Relief Tube
47. Pyrotechnic Pistol Type M-8
48. Signal Container Assembly Type A-6
49. Type A-2 Fire Extinguisher
50. First Aid Kit
51. Gun Loader's Seat
52. Load Adjuster

Figure 34 (Sheet 2 of 2)—Miscellaneous Equipment Diagram

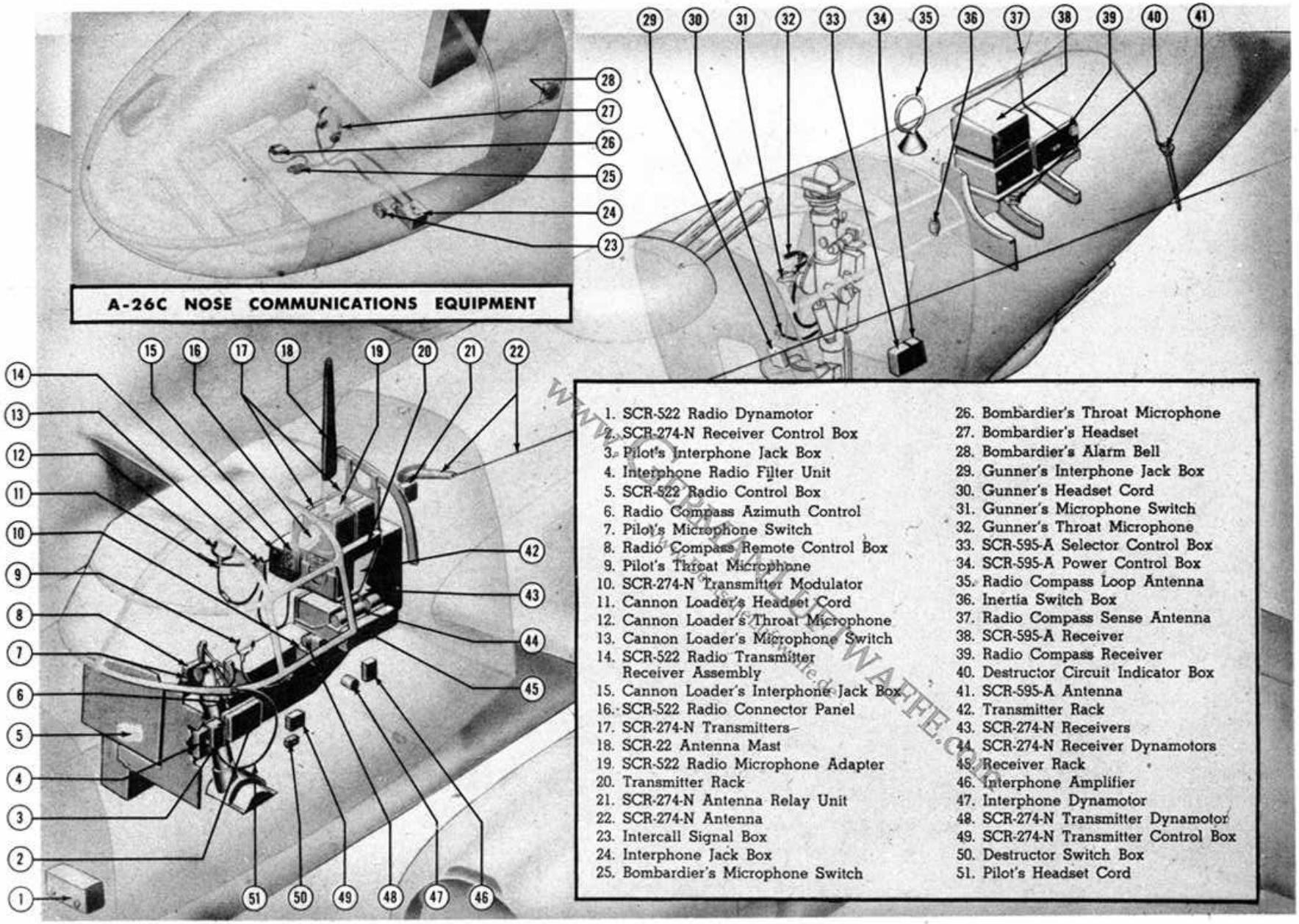


Figure 35 (Sheet 1 of 2)—Communications Equipment Diagram (On Some Airplanes)

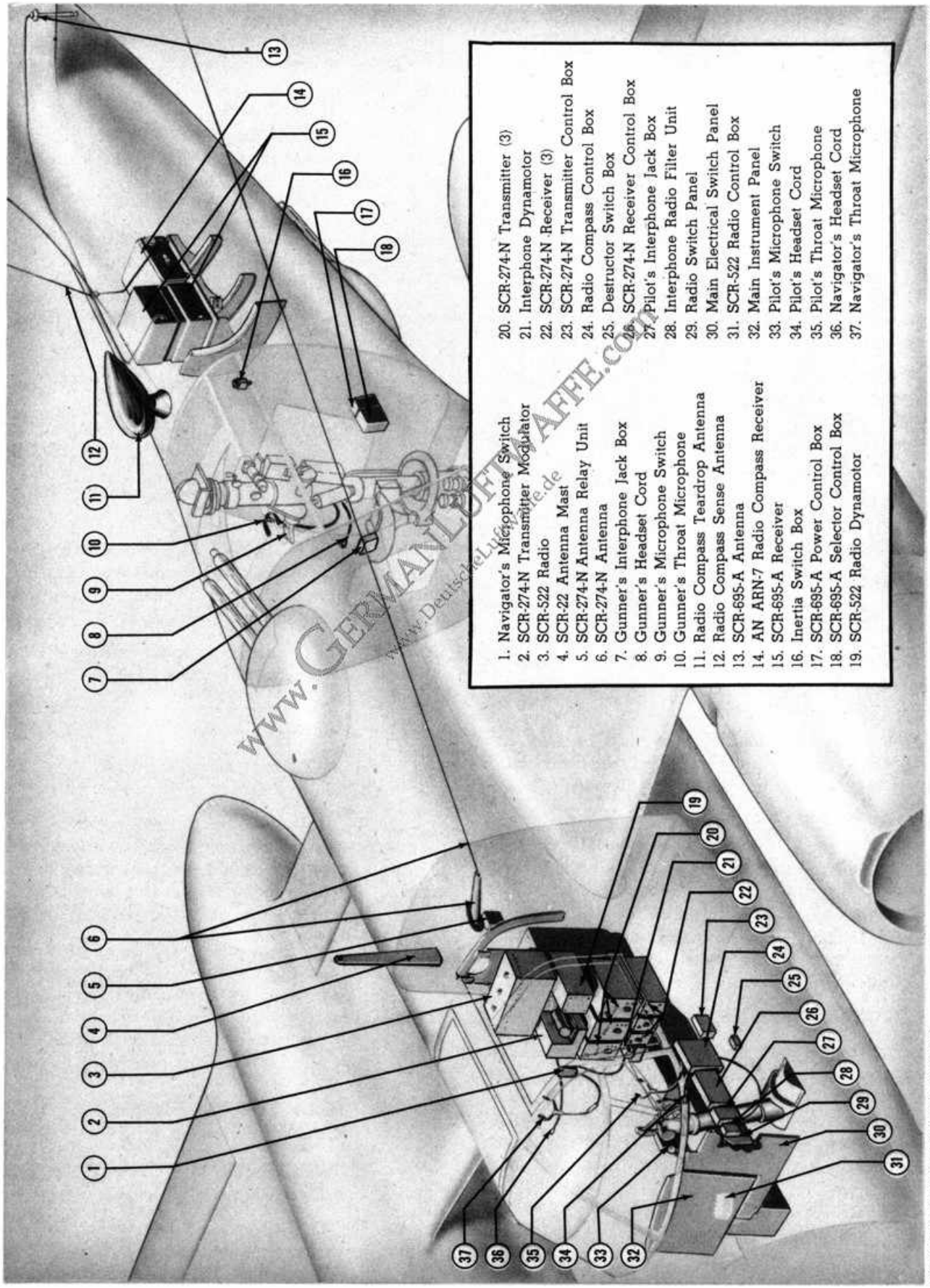


Figure 35 (Sheet 2 of 2)—Communications Equipment Diagram (On Other Airplanes)

(3) MN-26Y RADIO COMPASS SET OR AN/ARN-7 AUTOMATIC RADIO COMPASS.

(4) AN/ARR-1 RECEIVING EQUIPMENT (if installed).—For receiving radio frequency signals.

(5) BC-459 TRANSMITTER (stowed in some airplanes as loose equipment).—For airplane to airplane short range and airplane to ground operation.

(6) ART-13A TRANSMITTER (if installed) (operated by rear gunner).—For airplane to airplane long range and airplane to ground operation.

(7) SCR-515 RECOGNITION SET. — Provisions are made for installation of an alternate SCR-515 recognition radio set.

(8) RC-36 OR AN/AIC-2 INTERPHONE EQUIPMENT.—For crew member to crew member communication and for crew member participation in radio operations. An interphone jack box is installed at each crew member's station.

b. SPECIAL RADIO EQUIPMENT.—On some modified airplanes equipped for radar operations, the following communication equipment has been installed:

(1) RADAR SET AN/APN-9 (located in the radar operator's compartment).—This is airborne navigation equipment.

(2) LIAISON RADIO AN/ARC-8.—AN/ARC-8 is installed in the radar operator's compartment as temporary ferrying equipment.

(3) RADIO ALTIMETER AN/APN-1. — Set AN/APN-1 is installed to give a direct altitude indication. It is located in the pilot's compartment.

(4) RADIO AN/APN-3. *(See figure 35A.)* — AN/APN-3 is navigation equipment installed in the radar operator's compartment with an additional directional indicator and sensitivity switch in the pilot's compartment.

(5) RADIO SET AN/APQ-13A. — This equipment is an airborne radar system designed for navigation and high altitude bombing.

6. PILOT'S COMPARTMENT.

a. GENERAL.—The pilot operates his communications equipment, fixed guns, bombing, rocket, torpedo, and ice-eliminating equipment. Before the bombardier releases the bombs, the pilot must "select" either fragmentation or demolition bombs and the sequence of their release.

b. COMMUNICATIONS EQUIPMENT.

(1) OPERATION OF SCR-274-N COMMAND RADIO SET.

(a) GENERAL.—On some airplanes, controls are located on the left-hand side of the gunner's compartment permitting remote operation of the BC-454 and BC-455 receivers. When these sets are operated from the gunner's compartment the pilot's controls are stowed as loose equipment.

(b) OPERATION.

1. RECEIVER OPERATION. — Three separate receivers cover 190-550 kc, 3.0-6.0 mc and 6.0-9.1 mc frequency bands. Turn this equipment on as follows:

a. Channel selector switch — Set at the intermediate position between "A" and "B."

b. Receiver control switch — Select the control covering the desired reception frequency.

c. Filter selector switch — "BOTH" for normal reception, "RANGE" for range reception, "VOICE" for voice reception.

d. Tuning control — Tune to the desired frequency.

e. Volume control — Adjust to the desired volume.

2. TRANSMITTER OPERATION. — Three separate transmitters cover frequency ranges of 3.0-4.0 mc, 4.0-5.3 mc, and 5.3-7.0 mc. Operation of the transmitters is as follows:

a. Transmitter power switch—"ON" and allow 15 seconds for the transmitter to "warm-up."

b. Resistor control switch—In the "R-OUT" position at all times.

c. Transmitter selector switch — Turn to the position for the desired transmitter.

d. Transmitter control switch — "VOICE" and press the microphone button while speaking to transmit voice. "CW" and operate the key to transmit code. "TONE" and operate the key when transmitting to receivers not capable of receiving continuous wave transmission.

e. Knurled knob — The knurled knob is used for control of the microphone jack. In the extreme counterclockwise position, the microphone may be used. In the extreme clockwise position, transmission of intermittent signals is possible.

(2) OPERATION OF SCR-595-A or SCR-695-A RECEIVING SET.

(a) PROCEDURE FOR STARTING THE EQUIPMENT.

1. The equipment can be set in operation by setting the inertia switch and by moving the ON-OFF switch, located on the power control box, to the "ON" position or by moving the IFF ON-OFF switch, located on the main electrical control panel, to the "ON" position.

2. Set the coding selector switch to the position specified by the Communications Officer-in-Charge. If there is no specific instruction, set the selector switch to position 1.

3. Either the "EMERGENCY" guarded switch located on the power control box or the "EMERGENCY" guarded switch, located on the main electrical control panel, is used to operate a special signal in case of emergency. Detailed operation concerning these switches shall be obtained from the Communications Officer-in-Charge.

4. When ready to leave on a mission over enemy territory, insert Plug PL-177 into the destructor unit. If practicable, this should be done after the airplane leaves the ground.

(b) PROCEDURE FOR STOPPING EQUIPMENT.

1. Remove plug PL-177 from the destructor unit. Do this before landing if practicable; if not, do so immediately after landing.

2. Move all switches to the "OFF" position.

(3) OPERATION OF MN-26Y RADIO COMPASS SET (if installed).

(a) NORMAL RECEPTION (ANTENNA).

1. Master switch—"REC. ANT."

2. Frequency selector switch — Select the desired frequency range.

3. "CW" switch—"ON" or "OFF" as desired.

4. Tuning crank—Tune in the station.

5. Audio control — Adjust for the desired headset volume.

Note

The compass control and the azimuth control are not used for reception of communications.

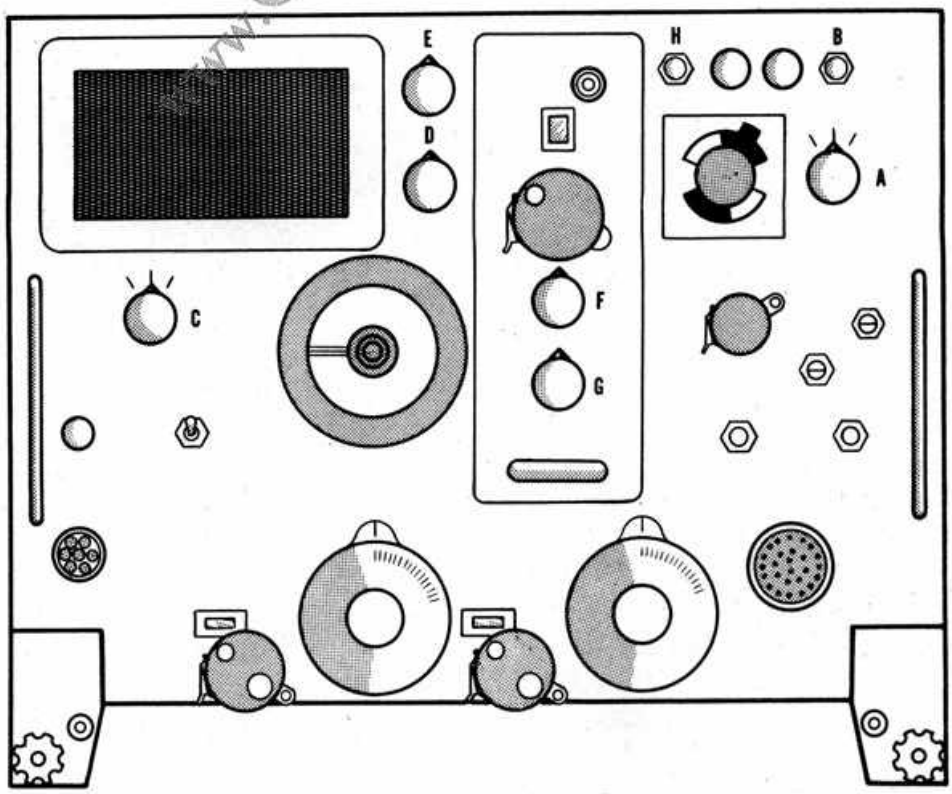


Figure 35A—AN/APN-3 Radio

(b) ANTI-RAIN-STATIC RECEPTION (LOOP).

1. Master switch—"REC. LOOP."

2. Frequency selector switch—Select the desired frequency range.

3. "CW" switch — "ON" or "OFF" as desired.

4. Tuning crank—Tune in the station.

5. Azimuth control—Set for maximum output in the headset.

6. "Audio" control — Set for the desired headset volume.

(c) DIRECTION FINDING.

1. VISUAL BEARINGS.

a. Master switch—"COMP."

b. Compass control — Adjust for the desired sensitivity.

c. Frequency controls — Select frequency range and tune in the desired station.

2. AURAL NULL BEARINGS — If the left-right indicator or the radio compass circuits become inoperative, bearings may be obtained as follows:

a. Master switch—"REC. LOOP."

b. Frequency controls — Select the desired frequency range and tune in the station. Check station identification.

Note

When taking bearing of weak signals, it is helpful to use the CW oscillator beat note.

c. Audio control—Adjust for the desired audio level.

d. Azimuth control—Rotate until the headset volume decreases to minimum.

(4) AN/ARN-7 AUTOMATIC RADIO COMPASS (if installed).—The equipment may be started by setting the function switch on one of the radio control boxes to the "COMP," the "ANT," or the "LOOP" position. The green light indicates that this box has control of the equipment.

(5) *AN/ARR-1 RADIO RECEIVING EQUIPMENT (IF INSTALLED) WHEN USED WITH RADIO COMPASS AN/ARN-7.

(a) Turn on automatic radio compass AN/ARN-7.

(b) Set the frequency band control on the control box to the 410-850 kilocycle band.

(c) Set the tuning dial to 710 kilocycles.

(d) Turn the CW-VOICE switch to the "CW" position and adjust the AUDIO control to a comfortable level in the headset.

(e) Turn the ZB switch to the "ON" position.

(6) BC-459 TRANSMITTER (STOWED IN SOME AIRPLANES AS LOOSE EQUIPMENT).—This transmitter is used in conjunction with the SCR-274-N Command Set and is operated per the instructions in paragraph 5, *a.* (1) of this section.

(7) SCR-515 RECOGNITION SET (IF INSTALLED).—With all three switches on the radio control box in the "OPERATE" or "ON" position, the equipment is fully in service.

(8) RADIO ALTIMETER AN/APN-1.—Low altitude radio altimeter AN/APN-1 is installed in the pilot's compartment on some airplanes modified for radar operation.

(a) To start equipment.—

1. Power switch "ON."

2. "RANGE SWITCH"—Set for low range unless the airplane is in flight above the low altitude range.

(b) To stop equipment.—Power Switch—Turn to "OFF" position.

c. PILOT'S GUN CONTROLS.

(1) TO FIRE CANNON (IF INSTALLED).—The operation of the cannon is as follows:

(a) Gun sight *(4, figure 21)*—Adjust to "0" degree setting.

(b) Gun sight rheostat—"ON."

(c) Receive "OK to fire cannon" signal from gunloader.

(d) Master camera safety switch *(figure 10)*—"GUNS AND CAMERA."

(e) 37 mm or 75 mm cannon selector switch *(figure 10)*—"ON."

(f) Maintain the airspeed that was predetermined at the time the cannon was boresighted.

(g) Depress the cannon trigger *(figure 36)*.

(2) TO FIRE .50 CALIBER NOSE GUNS, .50 CALIBER EXTERNAL WING GUNS (IF INSTALLED), OR .50 CALIBER INTERNAL WING GUNS (IF INSTALLED).

(a) Guns heater switch—"ON" as necessary to heat guns, then "OFF."

(b) Gun sight rheostat—"ON."

(c) Master camera safety switch—"GUNS AND CAMERA."

(d) .50 caliber nose gun selector switch or .50 caliber wing guns selector switch—"ON."

(e) "HOLD BACK" switch (if installed)—"ON."

(f) Charging switch (if installed)—Push down momentarily.

CAUTION

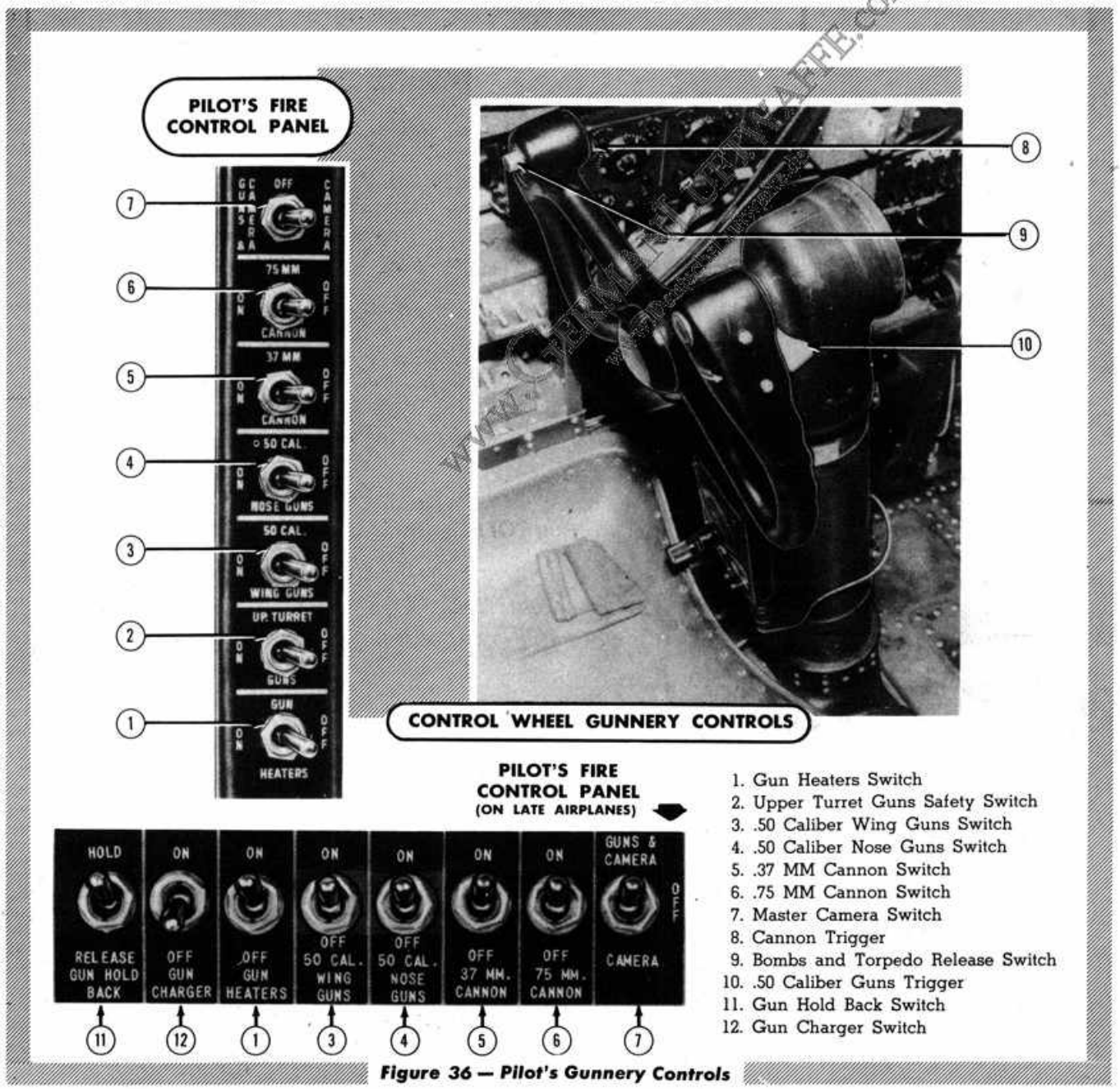
Do not hold switch down over 30 seconds.

(g) If airplane is on the ground, perform steps *(e)* and *(f)* above, before take-off.

(h) Depress .50 caliber guns trigger *(figure 36)*.

Note

This switch causes the gun to arm, and then fires.



1. Gun Heaters Switch
2. Upper Turret Guns Safety Switch
3. .50 Caliber Wing Guns Switch
4. .50 Caliber Nose Guns Switch
5. .37 MM Cannon Switch
6. .75 MM Cannon Switch
7. Master Camera Switch
8. Cannon Trigger
9. Bombs and Torpedo Release Switch
10. .50 Caliber Guns Trigger
11. Gun Hold Back Switch
12. Gun Charger Switch

Figure 36 — Pilot's Gunnery Controls

(i) Push down momentarily on charging switch (if installed).

Note

This opens the gun breech and causes it to remain open preventing "cook-off" and cools the guns. To fire guns again depress the trigger.

(3) TO FIRE UPPER TURRET GUNS. *(12, figure 33.)*—The turret guns are normally fired by the rear gunner, but may be operated by the pilot on airplanes with the flat type canopy *(7, figure 2)*, when locked in the "straight forward" position. The operation is as follows:

(a) Signal the gunner to lock the upper turret in the "straight forward" position and move transfer switch *(figure 51)* to the "PILOT" position.

(b) Master camera safety switch *(figure 10)*—"GUNS AND CAMERA" position.

(c) Upper turret guns safety switch *(figure 51)*—"ON."

(d) Upper turret locked forward indicator lamp *(figure 9)*—"ON."

(e) Gunsight rheostat—"ON."

(f) Depress the .50 caliber guns trigger *(10, figure 36)*.

(4) TO FIRE .50 CALIBER NOSE GUNS, WING GUNS, AND UPPER TURRET GUNS SIMULTANEOUSLY.—The nose guns, wing guns, and upper turret guns may be fired simultaneously by following the separate procedures in paragraph 7. *c.* (2) and (3) of this section, and then depressing the .50 caliber guns trigger.

(5) TELL-TALE INDICATOR. *(11, figure 19, sheet 1.)*—The tell-tale indicator, located on the instrument panel, indicates to the pilot the direction in which the gunner is pointing the remotely controlled turret guns with reference to his firing field and to its restriction by the empennage. Its purpose is to enable the pilot during combat to tactically cooperate with the gunner. By observing the tell-tale indicator, the pilot can, by suitable maneuvers or flight path changes, avoid obstruction of the turret guns fire by proximity of the empennage; and sometimes can prevent an enemy attacking from an unprotected angle. Refer to the Upper Turret Guns Fire Interruption Angles Diagram *(figure 48)*.

(a) GENERAL.—The two horizontal lines indicate the limit of turret guns fire. The upper line represents the upper limit of the lower turret guns fire. The lower line represents the lower limit of the upper turret guns fire. The shaded portion of the empennage image indicates that arc into which neither turret guns can fire. The clear portion of the empennage image indicates that area into which the guns of one turret can fire. The travel of the luminous spot on the vignette reflects the turret guns motion. The lateral travel of the luminous spot represents the movement of the turret azimuth and the vertical travel represents the movement of the guns elevation. The edge of the vignette is indicative of the maximum side fire (90 degrees rotation from the direct fore or aft position). When the turret guns are pointed in the aft hemisphere of rotation, the spot is round; when the guns are pointed in the forward hemisphere, a horn appears above the spot.

d. BOMBING EQUIPMENT. *(Figure 38.)*—Early airplanes are designed to carry demolition bombs only. Late airplanes will carry fragmentation bombs as an alternate load. Other airplanes will carry aerial parachute mines. Provisions are made on all airplanes for the alternate installation of two bomb racks under each wing. On some airplanes, the bombing control other than the gunsight rheostat, bomb and torpedo release switch, intervalometer controls and bomb rack control lever are located on the auxiliary electrical control panel *(figure 8)*. On other airplanes, the bombing controls other than the gunsight rheostat, bomb and torpedo release switch and the intervalometer controls, are located on the main electrical control panel *(figure 9)*. The bomb bay and wing racks are normally electrically operated by controls located in the pilot's compartment; however, either or both fuselage and wing racks can be manually released *(figure 37)* for bomb salvo. The electrical controls consist of switches located on the auxiliary electrical control panel *(figure 8)*, a push button located on the

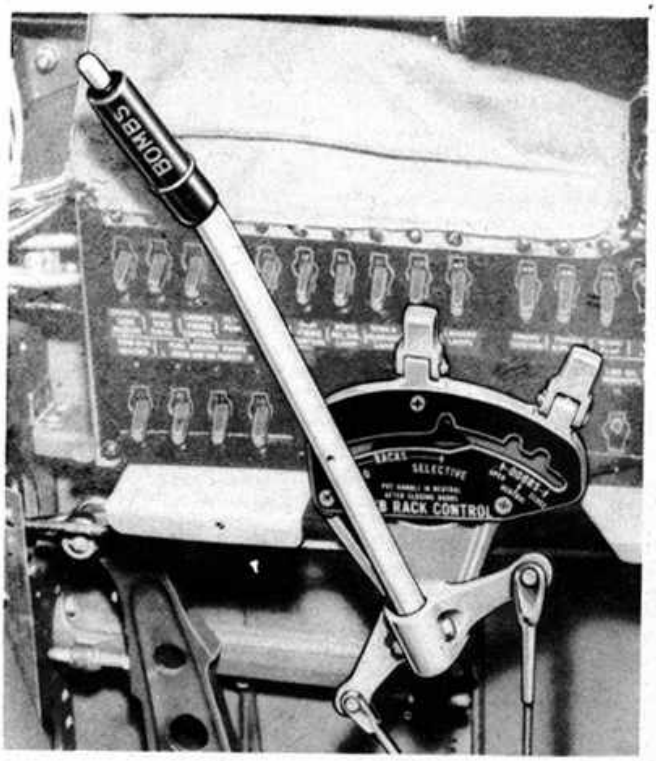
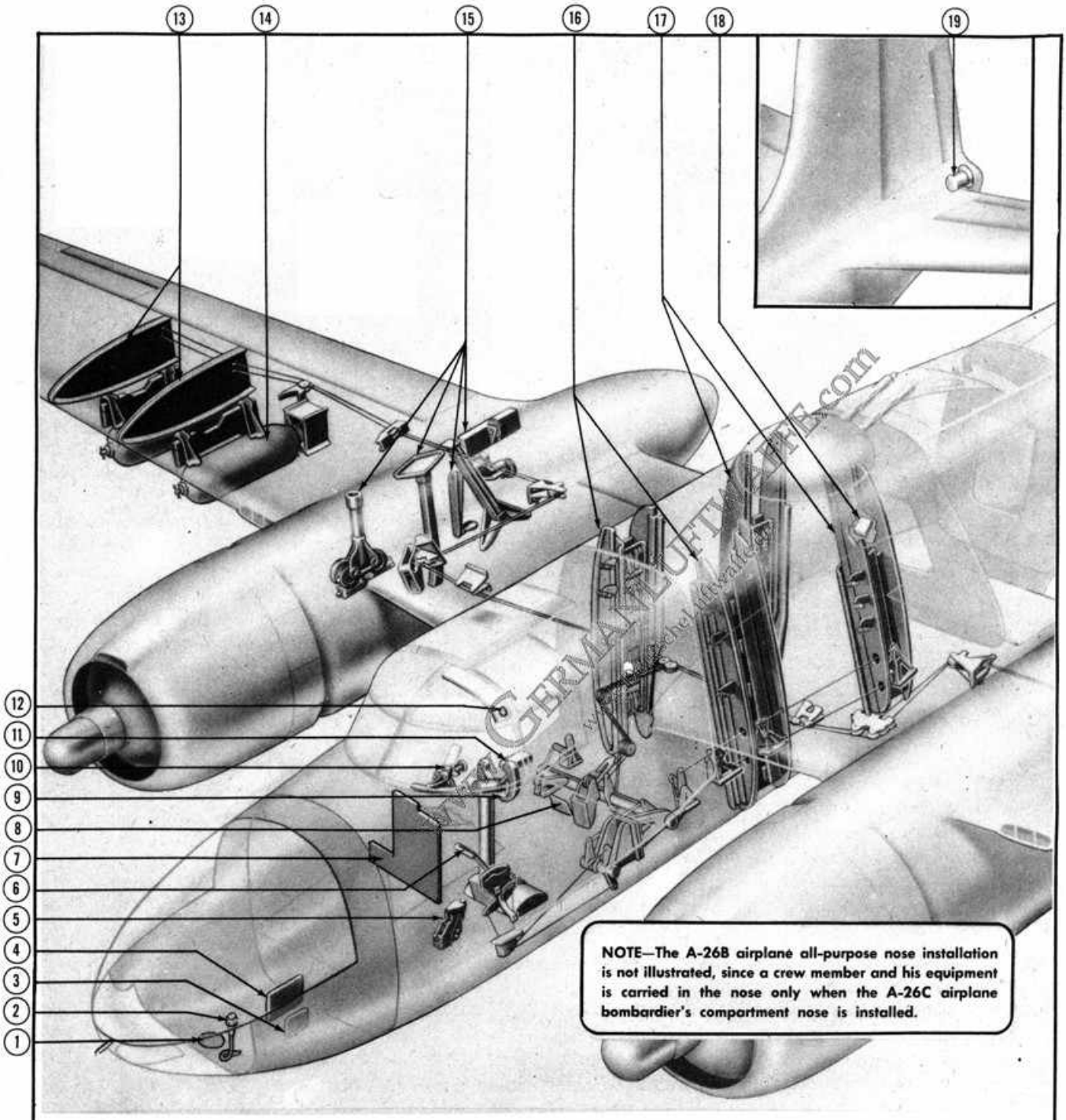


Figure 37—Bomb Rack Control (Early Airplanes)



1. Location of Bomb Sight and Glide Angle Attachment
2. Bombardier's Release Button
3. Bombardier's Distribution Panel
4. Bombardier's Control Panel
5. Gun and Bomb Sight (Type N-9) or (N-3B)
6. Bomb Release Control Lever
7. Electrical Control Panel
8. Bomb Bay Dome Lamp Switch
9. Bomb Release Switch
10. Gun and Bomb Sight Head (Type A-2)
11. Bombing Intervalometer
12. Gun and Bomb Sight Rheostat
13. Bomb Racks or Chemical Tanks (Each Wing — Alternate Installation)
14. Bomb (100 to 500 pound) (4 Places)
15. Bomb Hoisting Equipment — Stowed
16. Forward Bomb Racks
17. Aft Bomb Racks
18. Bomb Bay Dome Lamp Switch
19. Bomb Release Signal Lamp

Figure 38 — Bombing and Chemical Equipment Diagram

control wheel *(9, figure 36)*, and an intervalometer unit located on the control pedestal *(60, figure 21)*. The racks are manually controlled by the bomb rack control lever *(figure 37)*.

(1) BOMBING CONTROLS. – The following bombing controls are installed on all airplanes: A push button type bomb release switch *(9, figure 36)* located on the control wheel and an intervalometer unit *(60, figure 21.)*

(a) Some airplanes are equipped with manual provisions for bomb release in addition to the electrical provisions. The electrical switches are located on the auxiliary electrical control panel *(figure 8)*. The bomb rack control lever *(figure 37)* is provided for manual salvo release of either or both fuselage and wing bombs. The bomb rack control lever is also used to open and close the bomb bay doors.

(b) On some airplanes an "all electric" bomb release system is provided. All the bombing control switches are located on the main electrical control panel *(figure 9)*.

(2) OPERATION OF DEMOLITION BOMB RACKS.–The following instructions are applicable for bomb loading conditions when two wing bomb racks are installed in each wing. When the wing bomb racks are not installed, disregard the operational instructions that apply to the wing bomb racks *only*.

(a) TRAIN BOMB RACK RELEASE.

1. Demolition load check switch *(figure 9)*–"LAMP TEST." This check will light the demolition lamps and if any fail to light, they should be replaced.

2. Demolition load check switch *(figure 9)*–"LOAD CHECK." This check will light the indication lamps to show which bomb racks are loaded.

3. Gunsight rheostat *(figure 9)*–"ON."

4. Set the intervalometer controls *(60, figure 21)* as follows:

a. Train selector interval control – "TRAIN" position.

b. Bomb release interval control–Set for the desired spacing.

c. Counter dial controls–Set for the desired number of bombs to be released.

5. Bomb arming switch *(figure 9)*–Set to the desired arming position–"NOSE-TAIL" (impact) or "TAIL" (delayed).

6. Bomb selector switch *(figure 9)*–"DEMOL."

7. Bomb release signal lamp switch *(figure 9)* –Set to the desired position–"BRIGHT" or "DIM."

8. Bomb circuit main power switch *(figure 9)* (if installed)–"ON." The bomb circuit main power switch is installed only on some airplanes.

9. Bomb circuit selector switch *(figure 9)*– Set to the desired position–"FUS." or "WING AND FUSELAGE."

10. Bomb bay doors LATCHED indicator lamp *(figure 9)* (if installed)–"OFF." The bomb bay doors LATCHED indicator lamp is installed only on some airplanes. The bomb bay doors cannot be opened when the lamp is on (indicating the doors are locked in the CLOSED position).

11. Bomb bay door switch *(figure 9)*– "OPEN." On some airplanes the doors are opened by a bomb rack manual control lever *(figure 37)*. On airplanes with this lever, return the control to the "SELECTIVE" position *after* the bomb bay doors OPEN indicator lamp has illuminated.

CAUTION

Make certain personnel is clear of bomb bay doors when operated.

Note

In case of electrical failure of the hydraulic selector valve solenoids, the valve may be manually operated *(64, figure 21)*.

12. Forward bomb bay switch *(figure 9)* –"ON." Aft bomb bay switch–"ON."

13. Bomb and torpedo release switch *(9, figure 36)*–Depress momentarily. This will automatically release bombs, depending upon the counter dial control setting and the bomb release interval control setting.

14. Bomb bay doors switch *(figure 9)*– "CLOSE." Move the bomb rack control safety guard down to the safe position, if installed.

(b) SELECTIVE BOMB RACK RELEASE.– Selective release is accomplished in the same manner as train release (preceding) with the following exceptions:

1. When setting the intervalometer controls *(60, figure 21)*, move the train selector switch to the "SELECTIVE" position instead of the "TRAIN" position.

2. Move the bomb bay selector switch *(figure 9)* to the "SELECTIVE" position instead of the "TRAIN" position.

3. It is necessary to depress momentarily the bomb release switch *(9, figure 36)* each time it is desired to release a bomb.

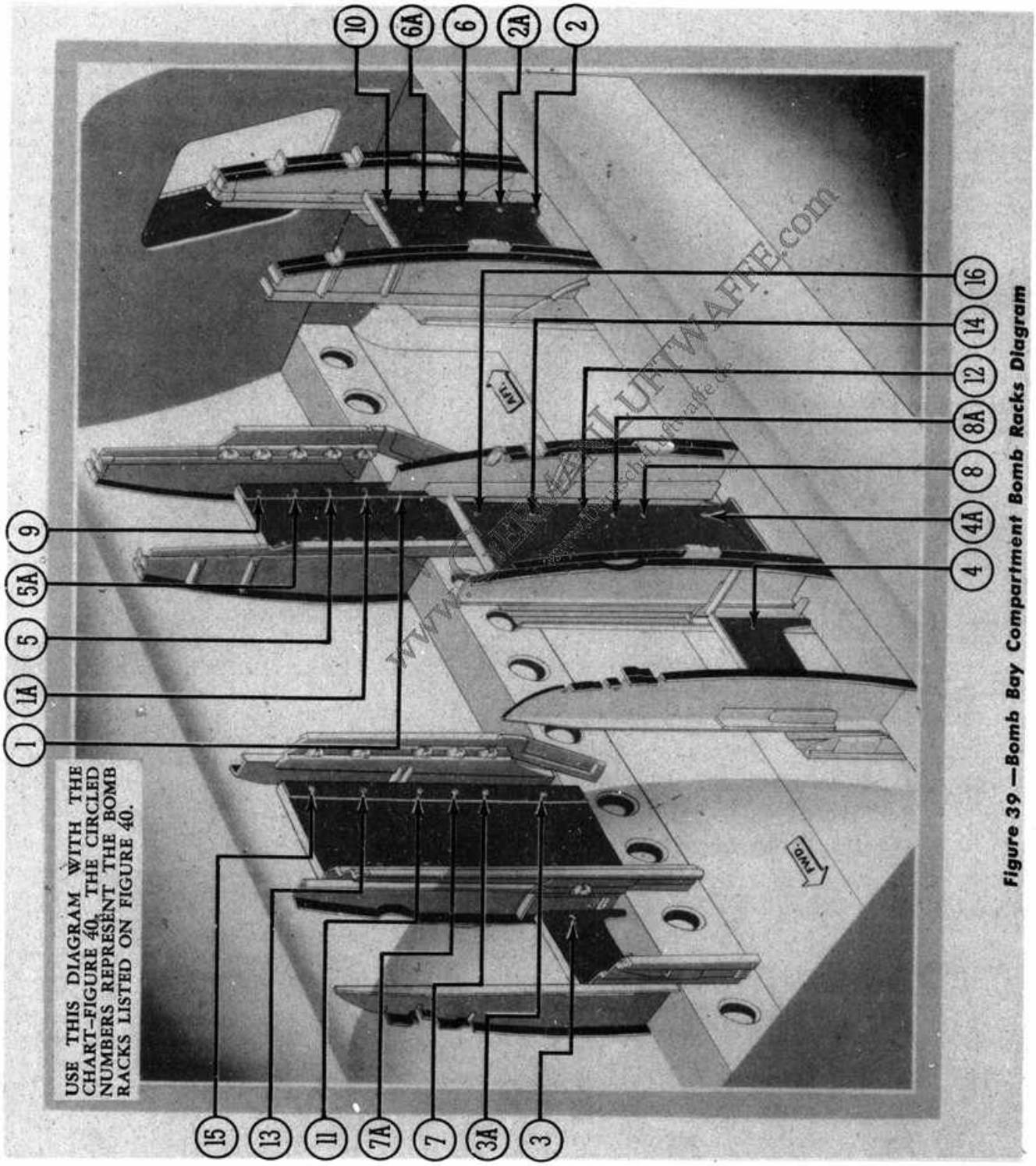


Figure 39—Bomb Bay Compartment Bomb Racks Diagram

DESCRIPTION OF BOMBS	FORWARD BOMB BAY														AFT BOMB BAY										
	L.H. BOMB RACK							R.H. BOMB RACK							L.H. BOMB RACK					R.H. BOMB RACK				
	4	4A	8	8A	12	14	16	3	3A	7	7A	11	13	15	2	2A	6	6A	10	1	1A	5	5A	9
1000# AN-M65 A1 GENERAL PURPOSE BOMBS		20 C&G							20 C&G							15 C 20 G					15 C 20 G			
1000# AN-MK33 ARMOR PIERCING BOMBS		20 C&G							20 C&G							20 C 0 G					20 C 0 G			
1000# AN-M59 A1 SEMI-ARMOR PIERCING BOMBS		20 C&G							20 C&G							12 C 20 G					12 C 20 G			
1000# AIRCRAFT MINE (A) AN-MK26 OR (B) AN-MK26 MOD. 1		20 C&G							20 C&G							12 C 20 G					12 C 20 G			
500# AN-M64 A1 GENERAL PURPOSE BOMBS		20 C&G							20 C&G						20 C&G			20 C&G		20 C&G			20 C&G	
500# AN-M58A2 SEMI-ARMOR PIERCING BOMBS		20 C&G							20 C&G						20 C&G			20 C&G		20 C&G			20 C&G	
500# INCENDIARY CLUSTER (A) AN-M7 OR AN-M9 OR (B) AN-M13		20 C&G							20 C&G						20 C&G			20 C&G		20 C&G			20 C&G	
PHOTO FLASH BOMB AN-M 46	20 C&G		20 C&G					20 C&G		20 C&G					20 C&G		20 C&G			20 C&G		20 C&G		
325# MK41 AIRCRAFT DEPTH BOMBS		20 C&G							20 C&G						20 C&G			20 C&G		20 C&G			20 C&G	
250# AN-M57 A1 GENERAL PURPOSE BOMBS	20 C&G			20 C&G				20 C&G			20 C&G				20 C&G			20 C&G		20 C&G			20 C&G	
100# M38A2 PRACTICE BOMBS	20 C&G		20 C&G					20 C&G		20 C&G					20 C&G		20 C&G		0 C 0 G	20 C&G		20 C&G		0 C 0 G
100# AN-M30 A1 GENERAL PURPOSE BOMBS	20 C&G		20 C&G		0 C&G	0 C&G	0 C&G	20 C&G		20 C&G		0 C&G	0 C&G	0 C&G	20 C&G		20 C&G		0 C&G	20 C&G		20 C&G		0 C&G
100# CHEMICAL BOMBS (A) M47A3 (B) M70	20 C&G		20 C&G					20 C&G		20 C&G					20 C&G		20 C&G		0 C&G	20 C&G		20 C&G		0 C&G
100# FRAGMENTATION BOMB CLUSTER M 28	20 C&G			20 C&G				20 C&G			20 C&G				20 C&G		20 C&G			20 C&G		20 C&G		
100# M5 PRACTICE CLUSTER BOMBS	20 C&G		20 C&G					20 C&G		20 C&G					20 C&G		20 C&G		0 C&G	20 C&G		20 C&G		0 C&G
125# M1A1 & M2A1 FRAGMENTATION CLUSTER	20 C&G		20 C&G		0 C&G			20 C&G		20 C&G		0 C&G			20 C&G		20 C&G		0 C&G	20 C&G		20 C&G		0 C&G
100# INCENDIARY CLUSTER M 10	20 C&G		20 C&G					20 C&G		20 C&G					20 C&G		20 C&G		0 C&G	20 C&G		20 C&G		0 C&G
100# AN-M4 FRAGMENTATION CLUSTER	20 C&G		20 C&G		0 C&G			20 C&G		20 C&G		0 C&G			20 C&G		20 C&G		0 C&G	20 C&G		20 C&G		0 C&G

COLOR CODE

BLUE: Bomb Loading Arrangement with shell case container installed

BLUE AND RED: Bomb Loading Arrangement without shell case container installed (Cannon not to be used).

NOTE

The number of degrees indicate the maximum climb or glide angle at which each bomb can be released.

When carrying fragmentation bomb racks refer to section V, paragraph 6 . (3) for description and operation.

Figure 40 — Bomb Bay Compartment Demolition Bomb Racks Loading Chart

(c) SALVO BOMB RACK RELEASE.

1. The following procedure is applicable only to airplanes with an "all-electric" bomb release system.

Note

There are no provisions for manual salvo.

a. Bomb arming switch *(figure 9)*—Set to the desired position—"OFF," "TAIL," or "NOSE AND TAIL."

b. Salvo control *(figure 9)*—Pull out to the "SALVO" position. This operation opens the bomb bay doors, and salvoes the wing and fuselage bombs (demolition).

CAUTION

Make certain personnel is clear of bomb bay doors when operated.

c. Bomb bay doors selector switch *(figure 9)*—"CLOSE" after all bombs have been released.

2. The following procedure is applicable only to airplanes not having the "all-electric" bomb release system.

a. ELECTRICAL SALVO.—Only the load on the wing bomb racks can be electrically salvoed. Move the guarded wing rack salvo switch *(figure 8)* on the pilot's auxiliary control panel to the "SALVO" position. (Bomb circuit switch must be in the "WINGS AND FUS." position.)

b. Salvo control *(figure 9)*—Pull out to the emergency measure which releases the load of all bomb racks (fuselage and wing). Manual salvo is accomplished as follows:

(1) Bomb rack control lever *(figure 37)* —"BOMB DOORS OPEN" position.

CAUTION

Make certain personnel is clear of bomb bay doors when operated.

(2) Bomb rack control lever *(figure 37)* —"SALVO" position as soon as the bomb bay doors open and indicator lamp lights.

(3) Bomb rack control lever — "BOMB DOORS CLOSED" position.

(4) Bomb rack control lever—"NEUTRAL," then lock the control in that position *after* the bomb bay doors open lamp is OFF.

CAUTION

Do not open or close the bomb bay doors on the ground without first making certain personnel is clear.

(3) OPERATION OF FRAGMENTATION BOMB RACKS.

(a) GENERAL.—Some airplanes are designed to carry a normal load of fragmentation bombs in the bomb bay not to exceed 2756 pounds. An alternate load of demolition bombs in the forward or aft bomb bay and fragmentation bombs in the other is possible. The forward bomb bay and the rear bomb bay carry 56 Type M-72 fragmentation bombs each. If the cannon is to be used, the three right-hand racks in the forward bomb bay must be omitted to allow space for the shell case container. If this condition exists, a load of 56 bombs may be carried in the aft bomb bay and 32 bombs may be carried in the forward bomb bay. The support for the bomb racks in the aft bomb bay is to be located on bomb hooks 5 and 6 and the support for the forward bomb bay is attached to bomb hooks 7 and 8. Each support contains 7 bomb racks and each bomb rack will hold 8 bombs. When the fragmentation bombs are released, two racks, one in the forward bay and one in the aft bay, are controlled by *one* "Select Train" switch and both racks are emptied in series.

(b) BOMBING CONTROLS.—The fragmentation bombing control switches are located on the main electrical control panel *(figure 9)*. These consist of a "Frag. Bomb Load Check" switch, a "Demol. and Frag." selector switch, a "Master Bomb" power switch, seven "Frag. Bomb Selective Train" switches, and the "Fragmentation Arming" switch. The bomb release switch is located on the pilot's control wheel.

(c) OPERATION.—The following instructions are applicable for bomb loading conditions when fragmentation racks are installed. If demolition bombs are to be carried in conjunction with the fragmentation bombs, they must be released separately.

1. Bomb bay door selector switch *(figure 9)* —"OPEN."

2. Bomb selector switch *(figure 9)*—"FRAG."

3. Bomb circuit main power switch *(figure 9)* —"ON."

4. Fragmentation bomb load check switch *(figure 9)*—"ON." This check will light the fragmentation indicator lamps for the bomb racks that are loaded. This switch must be "OFF" for bomb release.

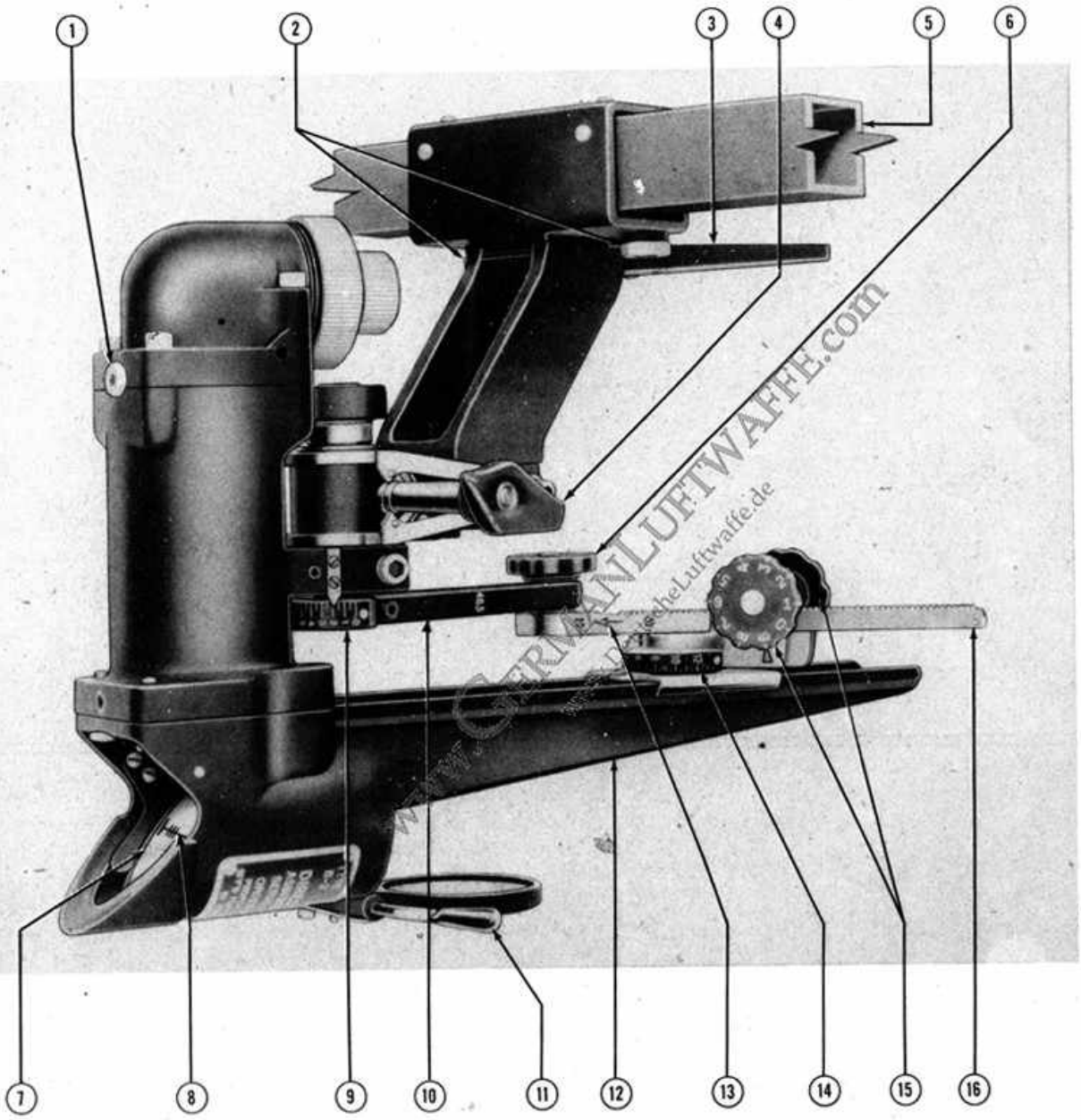
5. Fragmentation bomb select train switches *(figure 9)*—Operate for the number of racks to be released. For "TRAIN" release, each of the switches must be closed to the "TRAIN" position.

6. Fragmentation safe-arm switch *(figure 9)*—Set to the desired position—"ARM" or "SAFE."

7. Bomb release switch *(9, figure 36)*—Hold switch closed for number of bombs to be released. This is necessary because of a "Skip Station Switch" located

1. Main Electrical Control Panel
2. Bomb Release Control Lever (On Early Models Only)
3. Bomb and Torpedo Release Switch
4. Torpedo Director
5. Torpedo Sight Lamp Rheostat
6. Torpedoes (Mark 13 Model 1)
7. Rocket (HVAR) 5-Inch

Figure 41—Torpedo and Rocket Equipment Diagram (On Some Airplanes)



1. Reticule Lock Nut
2. Rider Screw (Two Places)
3. Torpedo Director Position Lock Lever
4. Master Lock Knob
5. Horizontal Cross-Bar
6. Mechanical Linkage Lock Knob
7. Transparent Luminous Reticule
8. Luminous Scale
9. Sighting Angle Protractor
10. Torpedo Arm
11. Polaroid Filter Lever
12. Sighting Arm
13. Target Course Arrow
14. Interception Angle Protractor
15. Target Arm Adjustment Knobs
16. Target Arm

Figure 42 — Torpedo Director, Type B-2

in each bomb rack. This switch is operated when the last bomb leaves a rack and sends the impulse to the next rack selected.

Note

To salvo the fragmentation bombs, it is necessary to put all of the frag. bomb select train switches *(figure 9)* in the "TRAIN" position and hold the bomb release switch DOWN until the fragmentation bomb racks are empty.

e. TORPEDO EQUIPMENT. *(Figure 41.)*

(1) GENERAL.—Two torpedoes may be carried as an alternate bomb load. With the torpedoes installed, bomb bay doors are wide open and part of the torpedoes protrude below the fuselage of the airplane. The torpedoes are released electrically by the Bombs and Torpedo Release Switch located on the pilot's control wheel. After the torpedoes are released, the bomb bay doors may be closed. No bombs can be carried in the bomb bay when the torpedo rack is installed.

(2) OPERATION. — The torpedo is released as follows:

(a) TORPEDO CIRCUIT SWITCH.—The torpedo circuit switch, located on the auxiliary electrical control panel *(figure 8)* on early airplanes, and on the main electrical control panel *(figure 9)* on late airplanes, must be in the "ON" position before the torpedo release switch can be used.

(b) TORPEDO RELEASE SWITCH. — The push-button type switch *(9, figure 36)*, located on the control wheel, is the same switch that is used to release bombs. To release the torpedoes the switch is momentarily depressed twice—once to release each torpedo.

(c) TORPEDO DIRECTOR. *(Figure 42.)*—The torpedo director mounts on a cross bar located forward and above the pilot. The director is used by the pilot to determine the approach to a moving target so that the torpedo will intercept the target on its course. All adjustments to the director necessary in flight can be accomplished with one hand. The director can be moved laterally on the cross bar and locked in any desired position. When not in use the director should be locked at the extreme left end of the cross bar. Prior to launching the torpedoes, the airplane must be maneuvered and corresponding adjustments made on the torpedo director as shown on *figure 43.*

f. ICE-ELIMINATING EQUIPMENT.

(1) PROPELLER ANTI-ICING SYSTEM. — An electrically driven pump supplies anti-icing fluid to the propeller anti-icer system from a supply tank, capacity 3¾ U. S. gallons. A rheostat type control *(figure 9)* is located on the main electrical control panel. The fluid quantity dip stick, integral with the supply tank, is the only means of determining the fluid supply. An additional reserve supply of anti-icing fluid should be carried in the airplane.

(2) CARBURETOR ANTI-ICING.—The carburetor air temperature is controlled by the carburetor air temperature control levers *(14, figure 17)*. These levers regulate the amount of cold air directed to the carburetors. The carburetor air temperature control levers, located on the control pedestal, should be in the "COLD" position unless icing conditions exist.

(a) OPERATION.

1. GENERAL.

a. Under non-icing conditions with good engine operation, the carburetor air temperature control lever should be in the full "COLD" position.

CAUTION

Unnecessarily high intake air temperatures may cause overheating of the engine with attendant danger of engine detonation and possible engine failure.

b. Under atmospheric conditions where *dry* snow or ice particles are present, leave the carburetor air temperature control in the "COLD" position until icing conditions are apparent.

c. When it is necessary to fly at reduced air speed, reduce the air speed by means other than closing the throttles.

Note

At small throttle openings, the carburetor is especially susceptible to icing under conditions when there is invisible moisture accompanied with cold weather or when there is moist air with warm weather. When in doubt, use carburetor heat.

2. GROUND RUNNING.—Under icing conditions, move the control to the full "HOT" position in order to maintain at least 15°C. carburetor air temperature to prevent ice formation and to insure that ice is eliminated from the induction system.

3. TAKE-OFF.—*Do not use carburetor heat during take-off under any conditions.*

Note

When icing conditions exist, carburetor heat should be used immediately before take-off to insure that all ice is removed from the induction system.

4. CLIMB.—When power is reduced, adjust the carburetor air temperature control to maintain at least 15°C. carburetor air temperature.

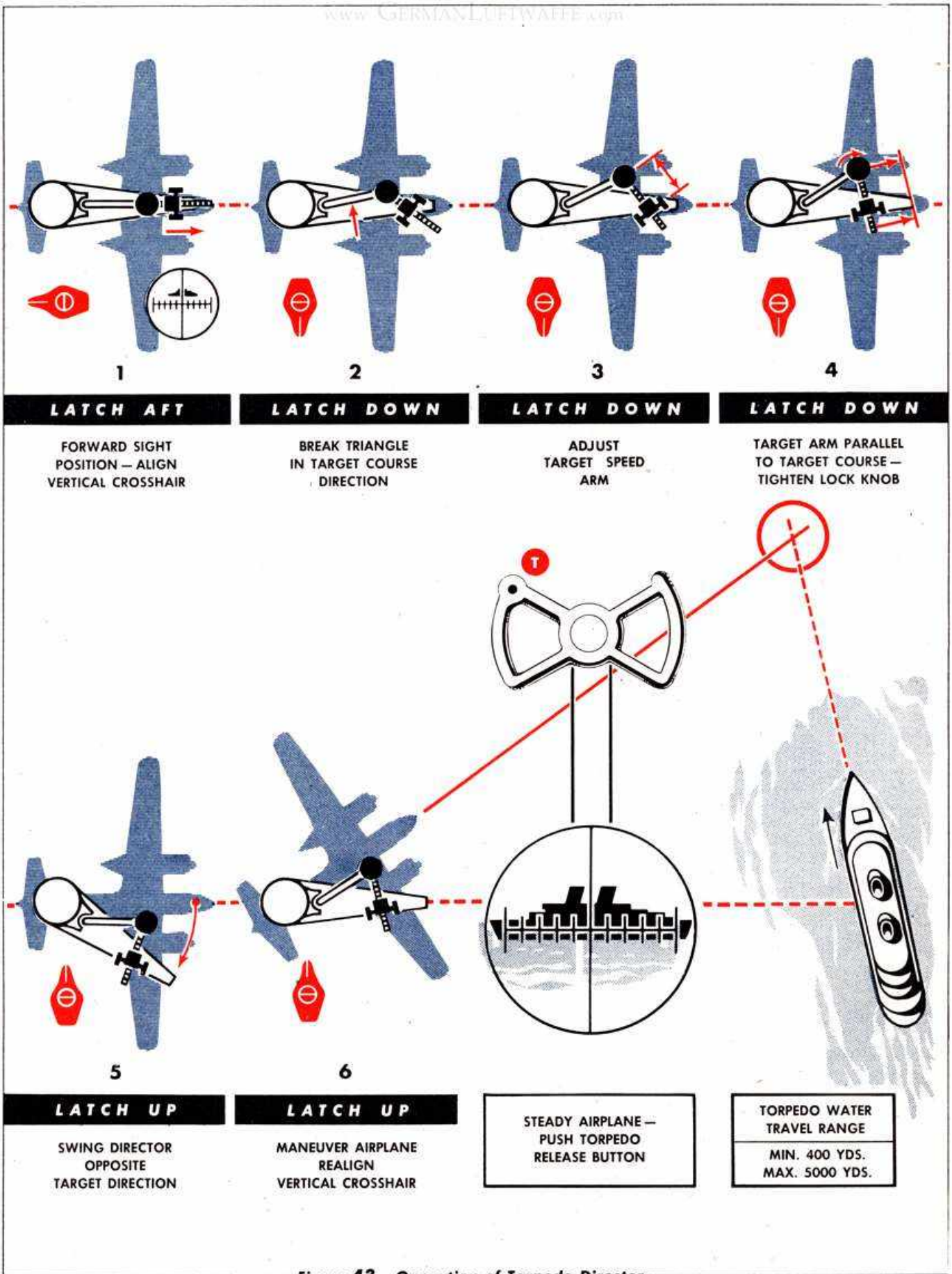
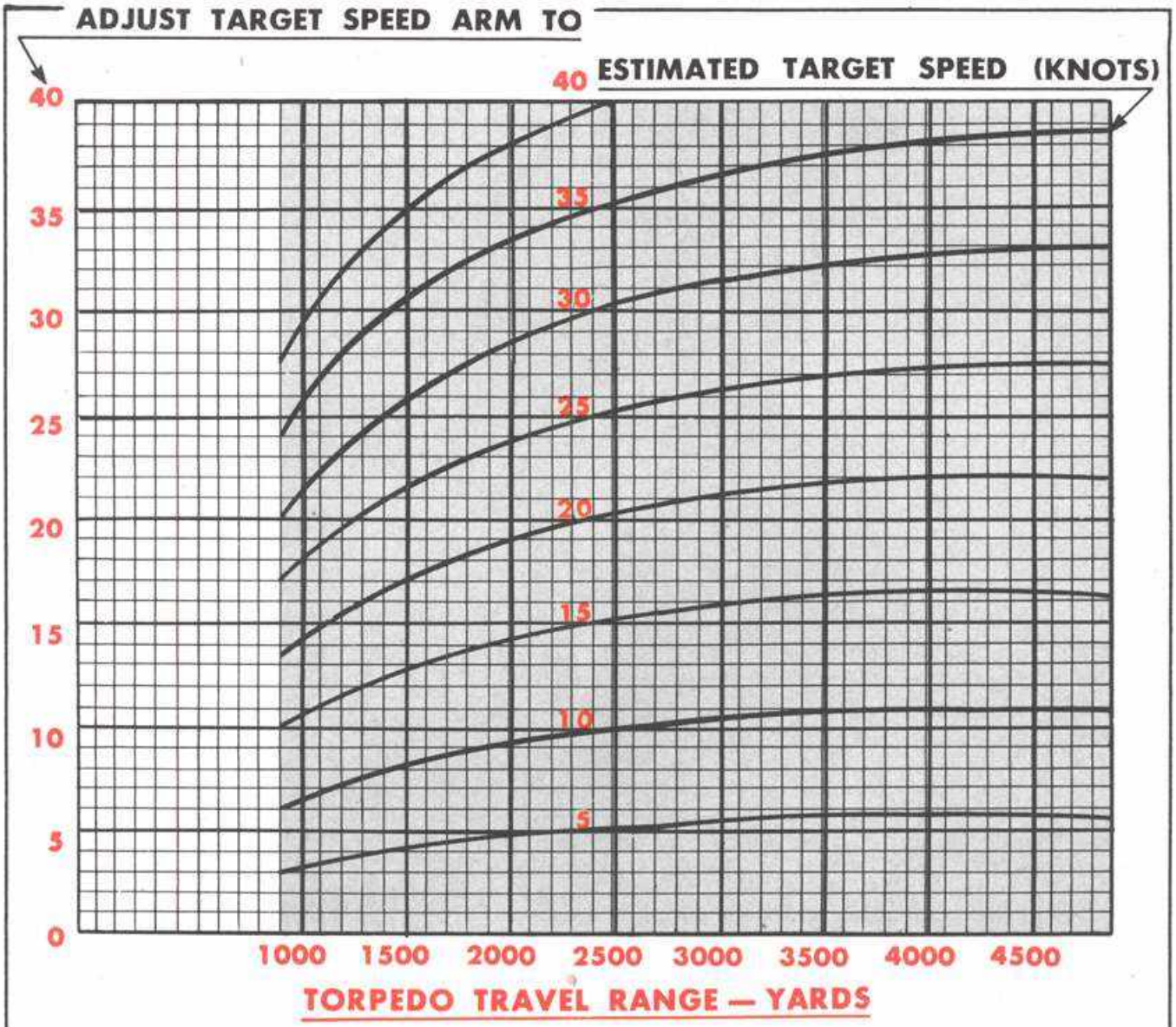


Figure 43 — Operation of Torpedo Director



INSTRUCTIONS:

(1) Locate the applicable vertical line, terminating at the bottom of the chart, which represents the estimated torpedo travel range.

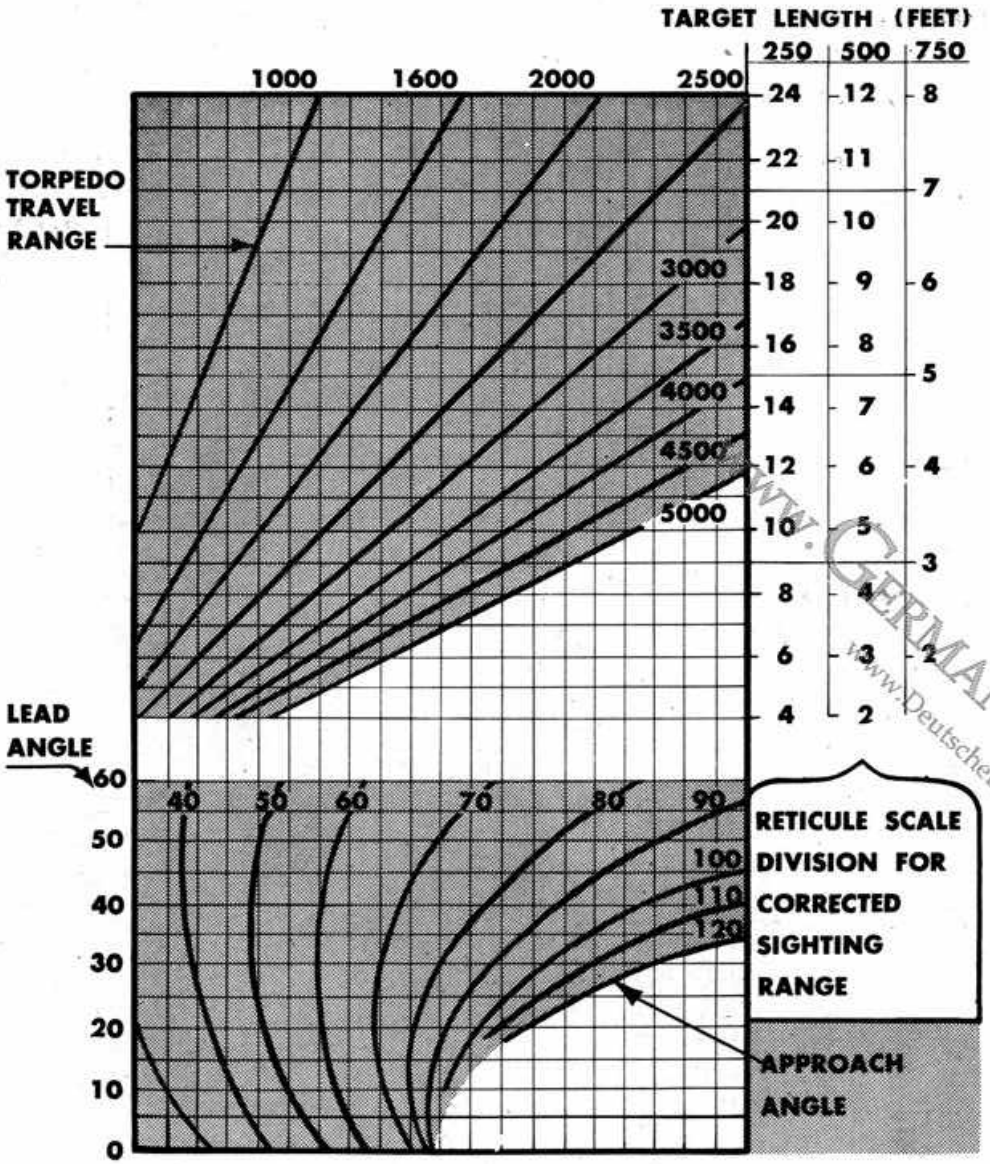
(2) Follow this vertical line up to the point at which it intersects with the applicable "Estimated Target Speed" curved line.

(3) Follow the horizontal line from this intersection to the left. The value represented at the point the line terminates is the corrected speed to which the target arm should be set.

EXAMPLE:

GIVEN: Range—2000 yards. Target speed—20 knots.
ANSWER: Corrected speed—19 knots.

Figure 44—Target Speed Correction Chart



INSTRUCTIONS:

(1) Locate the applicable horizontal line, terminating at the left of the chart, which represents the lead angle (taken from the sight angle protractor).

(2) Follow the horizontal line from left to right to the point at which it intersects with the applicable "approach angle" curved line (which is read from the interception angle protractor).

(3) Follow the vertical line from this intersection up to the point where it intersects with the "Torpedo Travel Range" (which is previously arbitrarily decided upon).

(4) Follow the horizontal line from this intersection from left to right. The figure under the applicable estimated "Target Length" column represents the number of reticule divisions that the target image should occupy at the time the torpedo is released.

EXAMPLE:

KNOWN: Lead angle—45 degrees. Approach angle—70 degrees. Torpedo Travel range—2000 yards. Length of target—500 feet.

ANSWER: The number of reticule divisions for the correct sighting range for the above conditions is 8.

Figure 45—Torpedo Sighting Range Finder Chart

5. CRUISING.—When cruising under severe icing conditions, use at least 75 percent engine power and set the mixture control at a richer setting than for best power.

Note

If possible, fly at an altitude where precipitation can be avoided and where the temperature is further from the freezing range.

6. LANDING.—Make certain the carburetor air temperature control lever is in the "HOT" position when the airplane is in a long glide before landing, but *the lever should be moved to the "COLD" position immediately prior to the landing approach and left in that position* so as to have full engine power available.

(3) PITOT TUBE HEATERS.—Ice is prevented from forming on the airspeed pitot tube by an electric heating unit incorporated in the pitot tube. The heating unit is controlled by the pitot heat switch *(figure 9)* located on the main electrical control panel. When icing conditions are imminent, turn the pitot heater switch located on the main electrical control panel to the "ON" position. When icing conditions do not exist, the switch should be in the "OFF" position.

(4) WINDSHIELD DEFROSTER SYSTEM.—A flexible hose is connected to the heating and ventilating system in each compartment and is provided to defrost the windshields.

(5) SURFACE DE-ICER SYSTEM (IF INSTALLED).—Ice is removed from the leading edges of the wings, vertical stabilizer and horizontal stabilizer by means of de-icer shoes actuated by air pressure. The de-icer system is normally operated from the pressure ports of the two vacuum pumps (one located in each engine section). In case of failure of one pump or failure of one engine, the system is operated by the operative vacuum pump.

(6) SURFACE DE-ICER SWITCH AND AIR PRESSURE GAGE (IF INSTALLED).

(a) The de-icer system ON-OFF switch *(figure 9)* is located on the pilot's main electrical control panel. The de-icer system should be in operation at all times when visible ice is forming on the airplane, except during take-off and landing.

(b) When the de-icer system is operating, the de-icer system air pressure gage should indicate 8-10 pounds per square inch.

(7) OPERATION.—The operation of the de-icing system affects the aerodynamic characteristics of the airplane. Do not operate the de-icer system during take-off, landing, or when the airplane is in any attitude during flight in which the airplane approaches the stalled condition.

7. GUNNER'S COMPARTMENT.

(Figure 46.)

a. SIGHTING UNIT AND TURRETS.

(1) GENERAL.—The upper turret and the lower turret, if installed, are remotely controlled from the sighting station *(figure 49)*. When power is directed to the turrets, the turret guns are automatically aligned with respect to the position of the sight unit. The sight unit is manually rotated by the gunner. Every movement of the sighting unit results in a similar movement of the turrets within the turret limits (provided the turret power switches *(figure 51)* are ON). If cold weather conditions exist, the turrets should be operated frequently to prevent sluggishness. On some modified airplanes equipped with radar, both the upper and lower turrets and the sighting stations are omitted.

(a) SIGHTING.—A 50 to 75 degree cone field of vision is permitted by each of the two periscopic sights. Change of the line of sight in elevation is accomplished by moving the sight unit handles up or down. The field of vision is changed from the upper hemisphere to the lower hemisphere, or vice versa, automatically by the sight unit. Continuous rotation of the right-hand handle is the only requisite to move the line of sight through its entire change of elevation and depression. Azimuth change of sight is accomplished by rotating sight unit about its vertical axis.

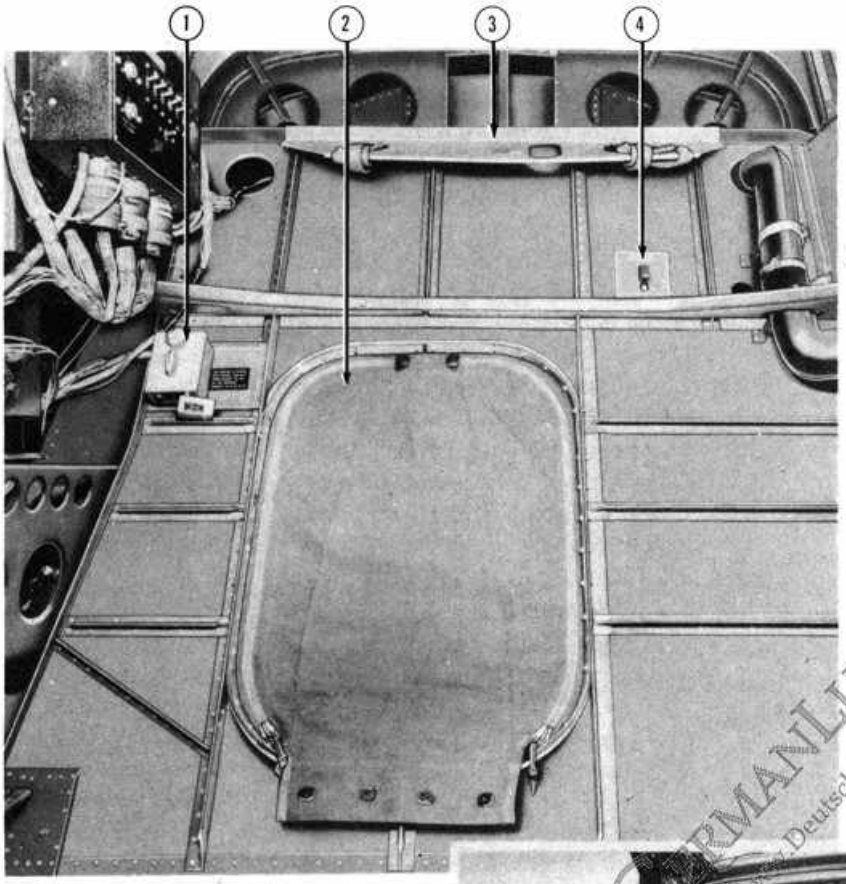
(b) CONTROLS ON SIGHT UNIT.

1. HANDLES. *(Figure 50.)*—The sighting handles are the central control of the sight unit and the turrets. The handles are used for sighting. An ACTION switch, a TRIGGER switch, and a MICROPHONE switch are located on the left-hand handle. The ACTION switch must be engaged before the turrets will operate or the guns will fire. The TRIGGER switch is to be operated by the index finger. The MICROPHONE switch must be depressed before VOICE can be transmitted.

2. SIGHT UNIT LATCH CONTROL. *(5, figure 49).*—The sight unit (and turret guns) may be latched in either the forward or the aft position by rotating the turrets to the desired position, then pushing down the sight unit latch control knob.

3. RETICULE ILLUMINATION RHEOSTAT CONTROL. *(6, figure 49.)*—The reticule illumination is controlled by the rheostat control knob. The intensity of illumination at which the rheostat is set is dependent upon the prevailing atmospheric conditions.

4. DESICCATOR PUMP CONTROL. *(4, figure 49.)*—The humidity within the sight unit is controlled by the use of the desiccator pump. Moisture can be prevented from forming or moisture can be eliminated from within the sighting unit by actuating the pump control.



VIEW LOOKING FORWARD

1. Interphone Control Box
2. Bomb Bay Access Door
3. Life Raft Stowage Rack
4. Bomb Bay Emergency Exit Switch

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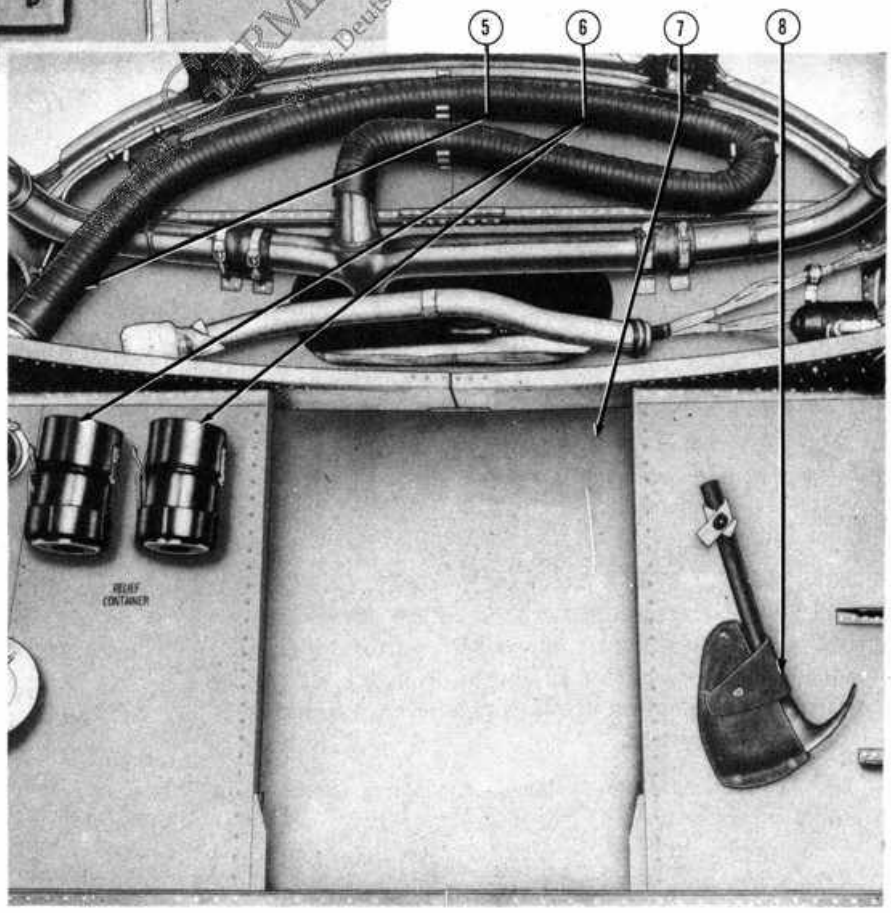

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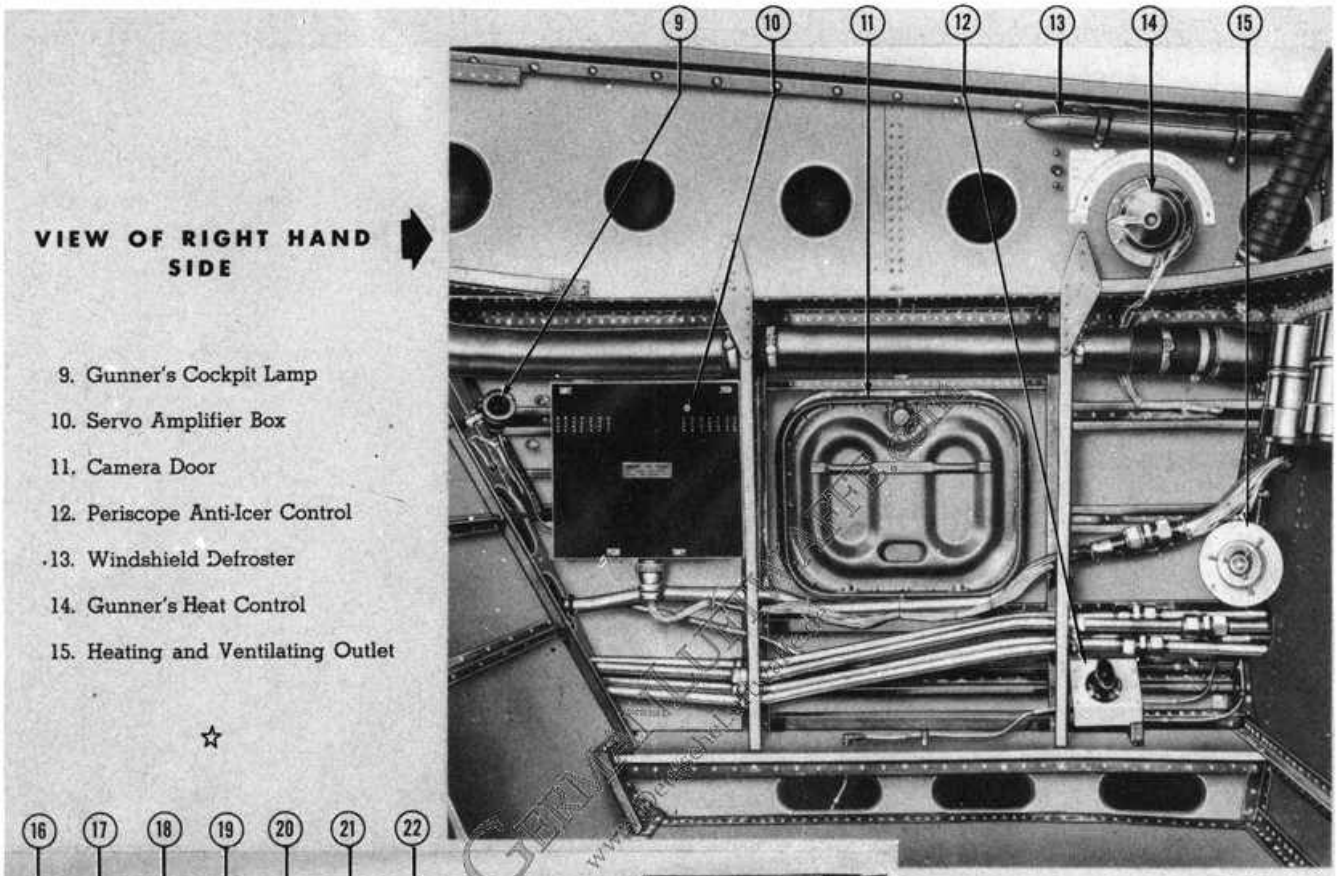
5. Hot Air Spot Defroster and Handwarmer
6. Relief Containers
7. Fuselage Aft Section Access Door
8. Fire Axe

VIEW LOOKING AFT

Figure 46 (Sheet 1 of 2)—Gunner's Compartment (on Some Airplanes)



VIEW OF RIGHT HAND SIDE

9. Gunner's Cockpit Lamp
10. Servo Amplifier Box
11. Camera Door
12. Periscope Anti-Icer Control
13. Windshield Defroster
14. Gunner's Heat Control
15. Heating and Ventilating Outlet

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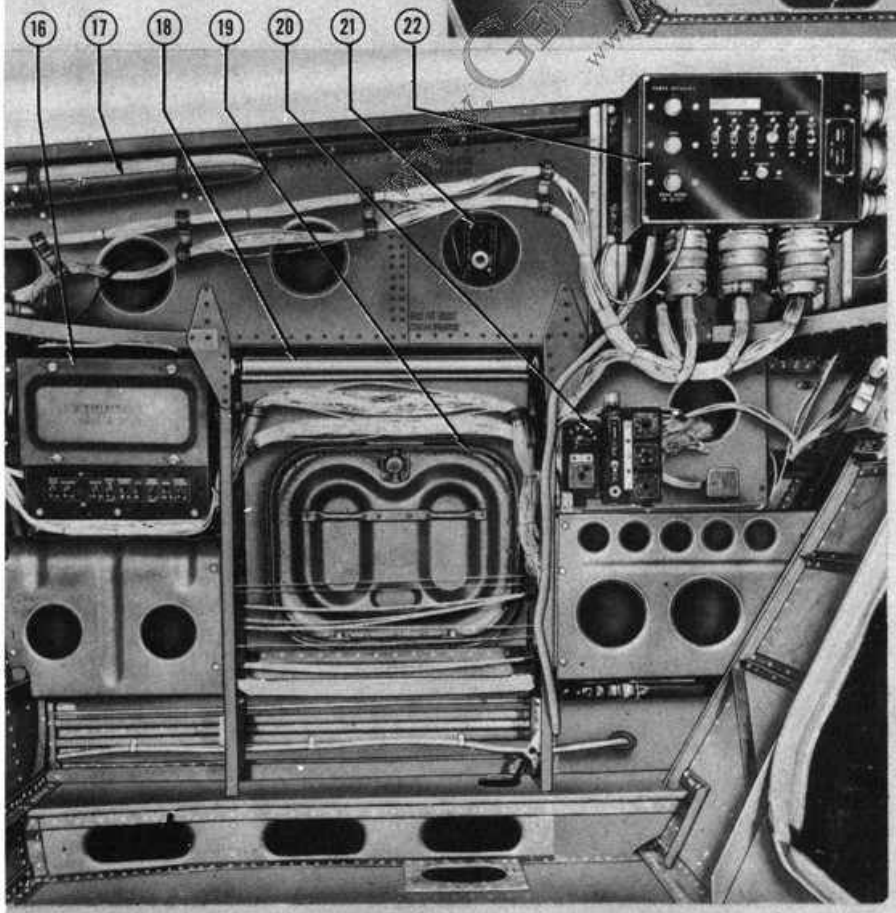

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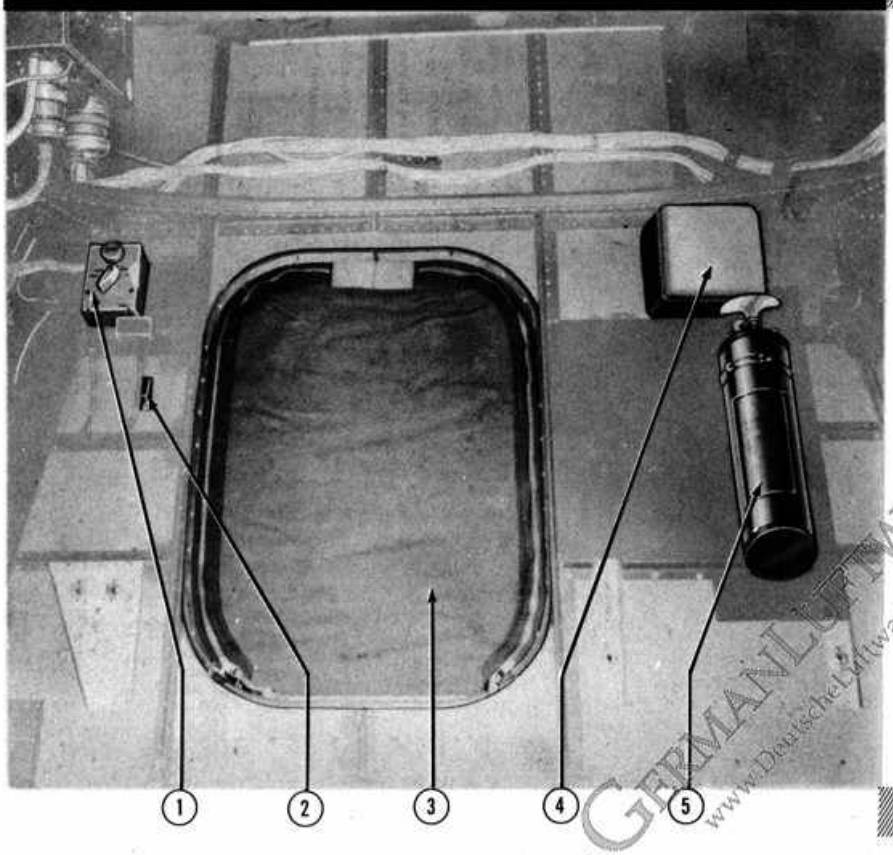
16. Fuselage Aft Relay Box
17. Windshield Defroster
18. Camera Door Curtain
19. Camera Door
20. SCR-595-A Receiving Equipment Control Box
21. Intercall Signal Box
22. Turret Control Box

VIEW OF LEFT HAND SIDE

Figure 46 (Sheet 2 of 2)—Gunner's Compartment (on Some Airplanes)

VIEW LOOKING FORWARD



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1. Interphone Control Box
2. Bomb Bay Emergency Exit Switch
3. Bomb Bay Access Door
4. First Aid Kit
5. Carbon Tetrachloride Type Fire Extinguisher

6. Gun Charger System Air Compressor Unit
7. Relief Containers
8. Fuselage Aft Section Access Door
9. Fire Axe
10. Inertia (Impact) Switch Unit
11. Inverter (Remote Indicating Compass)

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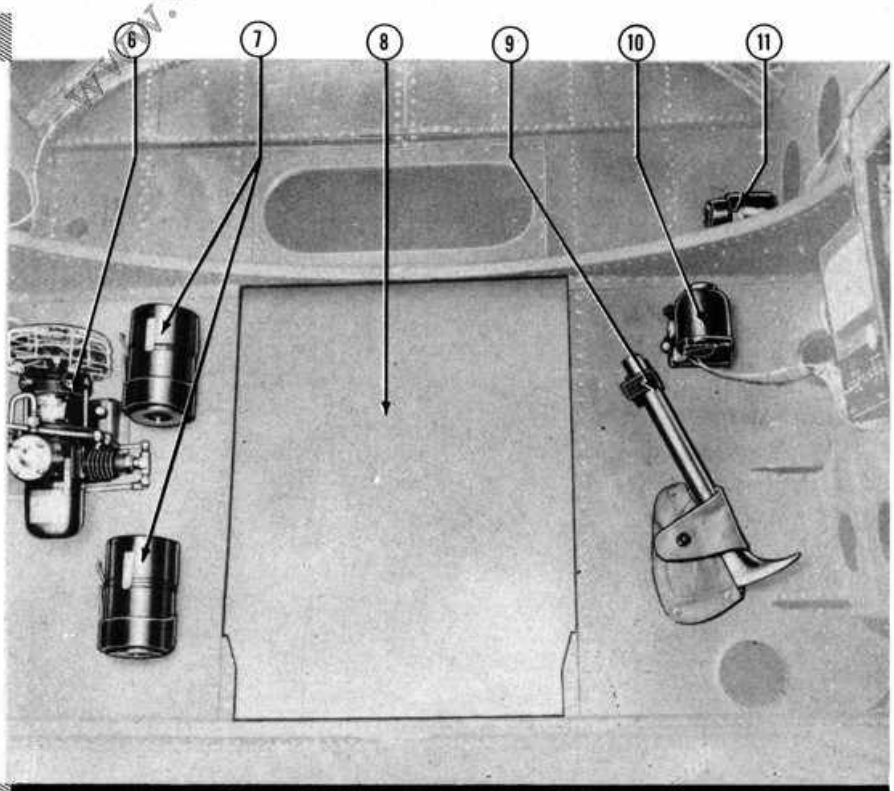


VIEW LOOKING AFT

Figure 47 (Sheet 1 of 2)—Gunner's Compartment (on Other Airplanes)

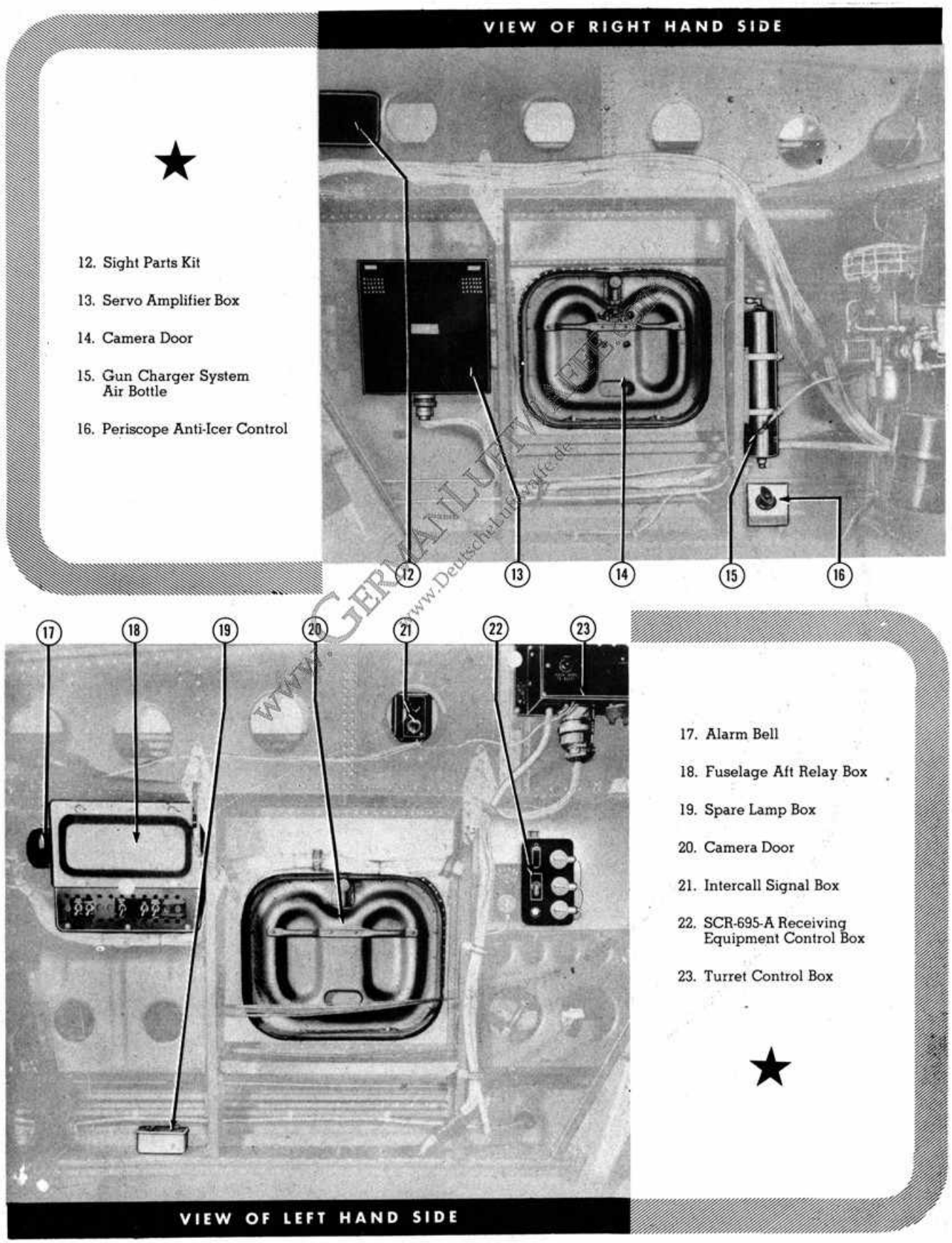


Figure 47 (Sheet 2 of 2)—Gunner's Compartment (on Other Airplanes)

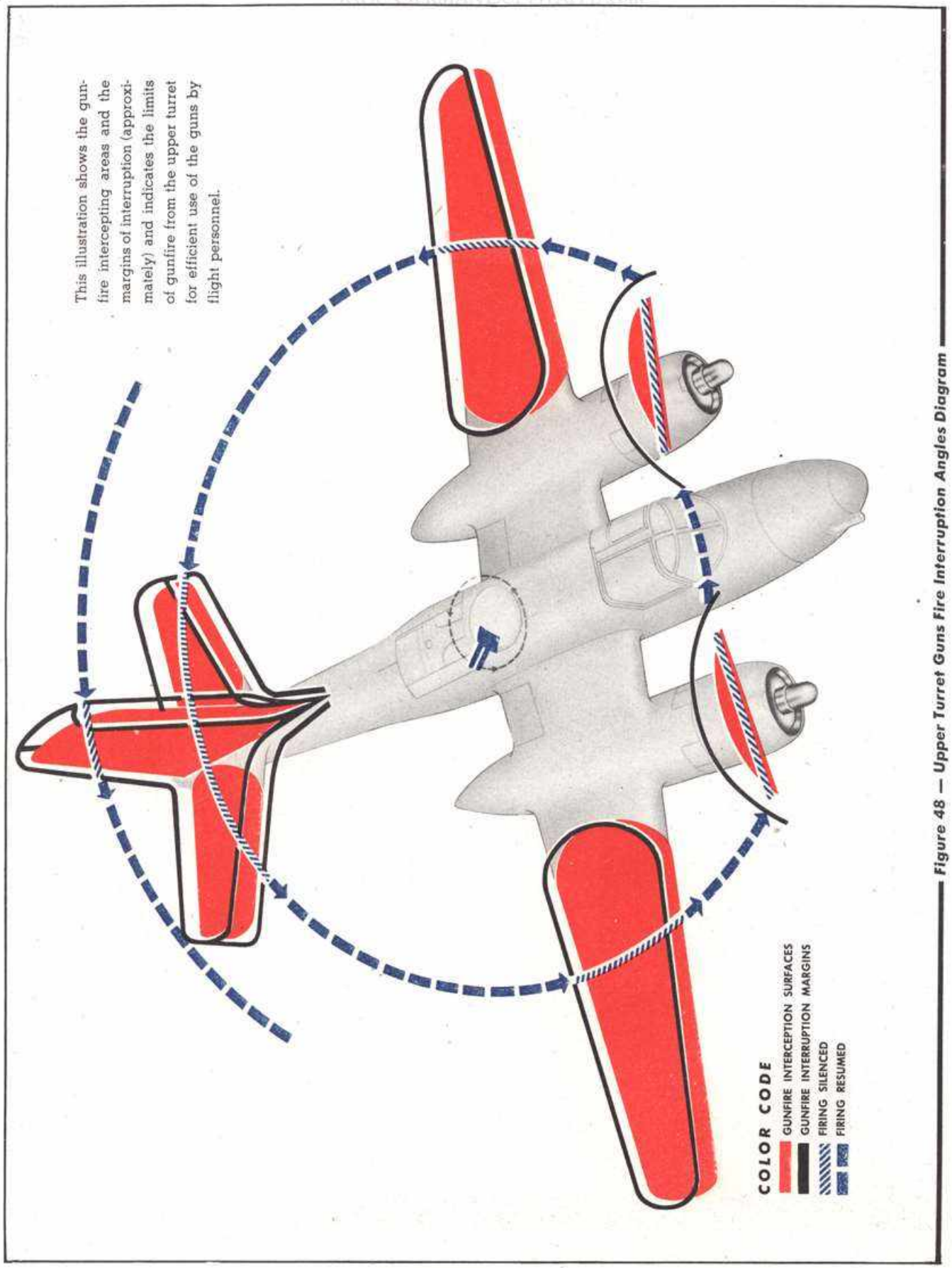


Figure 48 — Upper Turret Guns Fire Interruption Angles Diagram

(c) TURRET CONTROL BOX. *(Figure 51.)*

1. "AC" SWITCH.—When "ON," the "AC" switch furnishes "STAND-BY" power to the system, and permits scanning. The turret power switches should not be turned ON until the servo amplifiers have been allowed to "warm up."

2. TURRET SWITCH.—When the "UPPER" and the "LOWER" turret switches are turned "ON," the turrets will be automatically aligned with respect to the position of the sighting unit, provided the ACTION switch is engaged.

CAUTION

Turn on the upper and lower turret power switches as instructed on the turret control box.

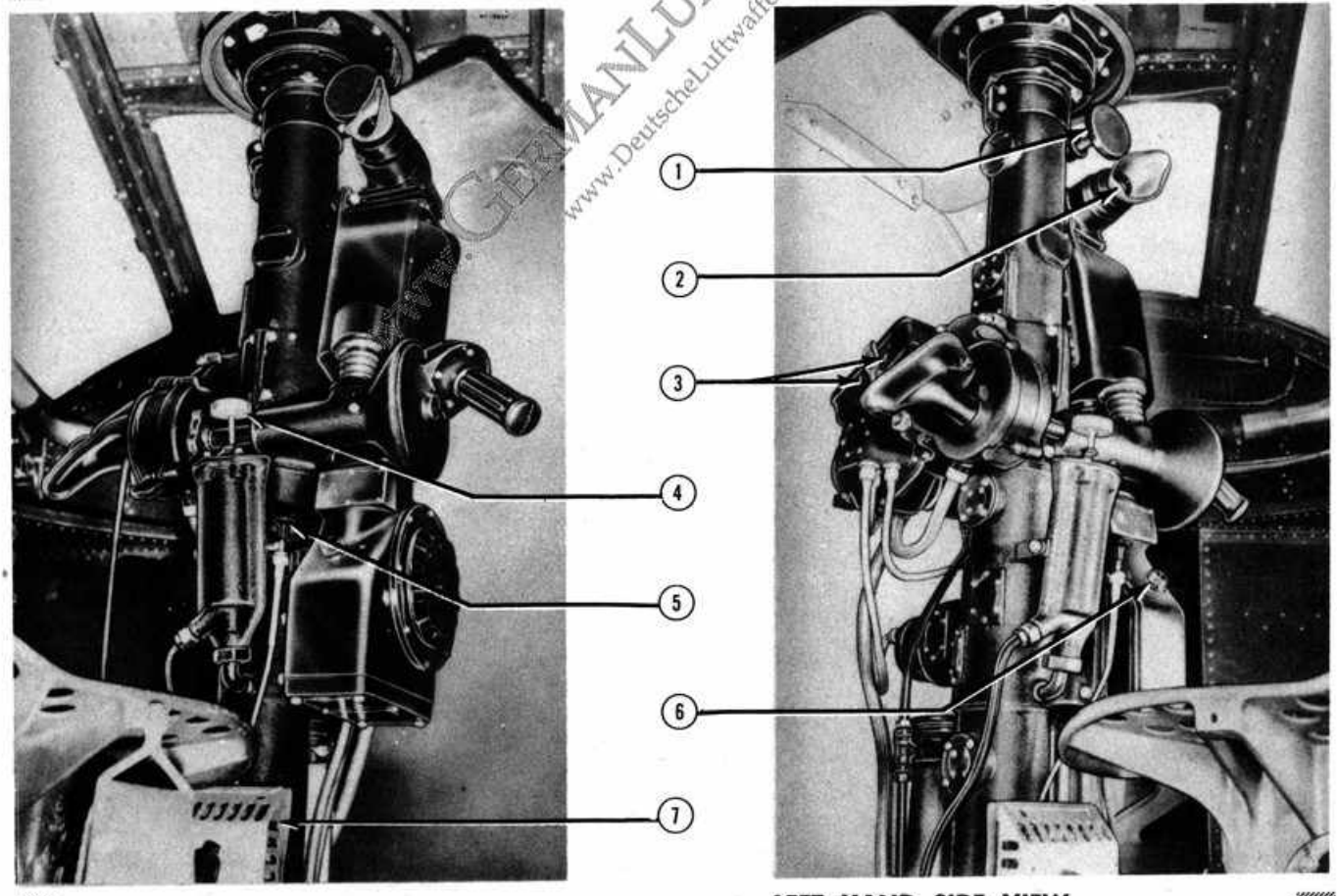
3. TRANSFER SWITCH.—When the transfer switch is in the "GUNNER" position, both turrets can be operated only by the gunner. On airplanes using the flat type canopy, when the transfer switch is in the "PILOT" position, and the upper turret is in the "straight forward" position, the pilot has complete control of the upper turret guns; however, the lower turret can be individually controlled by the gunner, provided the sight unit is unlatched, and the action switch depressed.

(2) OPERATION.

(a) IMMEDIATELY AFTER TAKE-OFF.

1. Turn "GUN" switches to "FIRE."

2. Turn "TRANSFER" switch to "GUNNER."



1. Head Rest
2. Eye Piece
3. Headset and Microphone Cord Connections
4. Desiccator Handle
5. Sight Latch
6. Reticule Illumination Rheostat Control
7. Suit Heat Rheostat

Figure 49 —Gunner's Sighting Unit

3. Unlatch azimuth and elevation sight and seat locks.

(b) BEFORE GOING INTO ACTION.

1. Turn "AC" power switch to "ON."

2. After 10 seconds turn "UPPER" power switch to "ON."

3. After 10 seconds turn "LOWER" power switch to "ON."

(c) IN ACTION.

1. Depress "ACTION" switch on sight grip.

2. Track target allowing for lead and bullet deflections.

Note

The sight is non-compensating.

3. Fire guns by squeezing trigger.

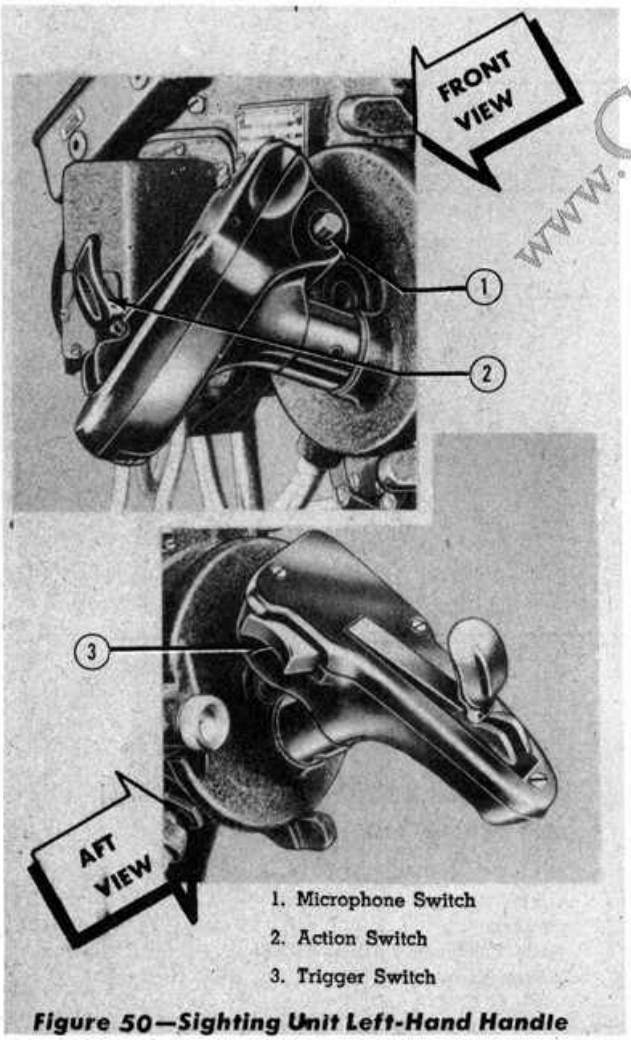


Figure 50—Sighting Unit Left-Hand Handle

(d) TO TRANSFER UPPER TURRET TO PILOT, WHEN FLAT TYPE CANOPY IS USED.

1. With action switch depressed, move sight unit to horizontal and forward position and latch.

2. With action switch depressed, turn transfer switch to "PILOT."

3. Turn "UPPER" turret switch to "OFF."

4. To operate and fire lower turret: Unlatch sight, depress action switch, estimate correction and squeeze trigger.

(e) TO RETURN UPPER TURRET TO GUNNER.—Turn transfer switch to "GUNNER," and turn upper turret switch "ON."

(f) TO STOW TURRETS.

1. With action switch depressed, move sight unit to horizontal and aft position and latch.

2. Turn "UPPER" and "LOWER" power switches to "OFF."

3. Turn "AC" power switch to "OFF."

(g) BEFORE LANDING.—Turn all switches to "OFF" or "SAFE."

b. ART-13A TRANSMITTER AND BC-461 REEL CONTROL BOX OPERATION (IF INSTALLED).

(1) OPERATION OF TRANSMITTER.—To start the equipment, turn the EMISSION selector switch to the "VOICE" position.

(2) OPERATION OF REEL CONTROL BOX.—The antenna wire may be reeled out or in as desired by using the switch on the control box. When the desired length is attained as indicated either by the counter or by a tuning indication, the switch should be thrown to "OFF." When it is desired to retract the antenna, the switch should be thrown to the "IN" position.

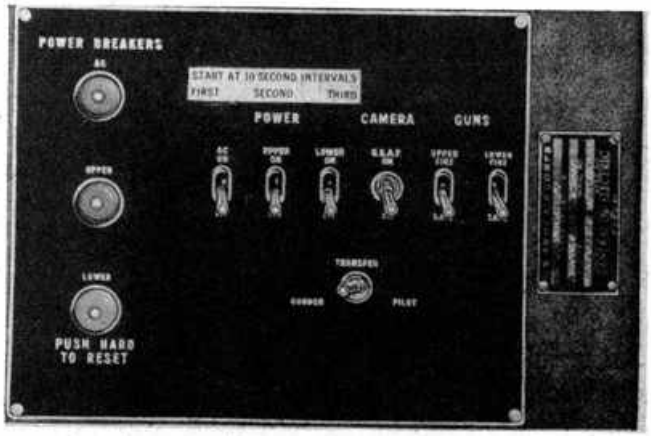


Figure 51—Turret Control Box

c. RADAR SET AN/APN-9.

(1) To start equipment.—

(a) "AMPLITUDE BALANCE" Control—set at its center position of rotation.

(b) "FINE DELAY" control—set at its center position of rotation.

(c) "DRIFT" control—set at its center position.

(d) "RECEIVER GAIN" control—turn clockwise until the "STATION" rate identification (pilot light) illuminates. Wait for 5 minute warm-up period.

(2) To stop equipment.—

(a) "RECEIVER GAIN" control — turn to "POWER OFF."

(b) Check to see that pattern on indicator screen has disappeared.

d. LIAISON RADIO AN/ARC-8.

(1) To start transmitter—"EMISSION" switch—turn to "VOICE" position.

(2) To stop transmitter—"EMISSION" switch—turn to "OFF" position.

e. RADAR SET AN/APQ-13A

(1) To start equipment. —

(a) Check inverter "ON" on left-hand side of pilot's compartment.

(b) Press "POWER ON" button on the control box.

(c) Momentarily turn "BRIGHT" control or indicator as far clockwise as necessary to determine whether a line of light appears in the center of the screen; then immediately return the control to its full counterclockwise position to prevent damage to the indicator screen.

(d) Turn meter switch on the control to "XTAL 1"; then turn "RCVR TUNING" knob until the meter reading is at its maximum value. Meter reading should be between 6 and 11 on the lower scale.

Note

Allow at least one minute between steps *(a)* and *(d)* to allow tubes to warm up.

(e) Press the "TRANS ON" button on the control box. The meter should indicate between 6 and 8 milliamperes on the lower scale within 10 seconds.

(f) Turn "RANGE, NAUT MILES" switch on the control box to all its positions, first with the "AFC-BEACON" switch on "AFC-OFF" and then on "BEAC-ON." The meter should read between 7 and 9 milliamperes for all these conditions.

(2) To place the equipment in standby condition. —

(a) Press "TRANS OFF" button on the control box.

(b) Check that the "ANTENNA CONTINUOUS" switch is turned to "OFF."

(3) To stop equipment. —

(a) Press "TRANS OFF" button on the control box.

(b) Press "POWER OFF" button on the control box.

(c) Turn "BRIGHT" control on the indicator to full clockwise position.

(d) Return all controls to their initial settings.

f. AN/APN-3 *(See figure 35A).*

(1) To start equipment—

(a) Set switch "A" to its middle position. Operate 15 minutes.

(b) Press push button "B." After one minute a circular sweep should appear on indicator tube.

(c) Turn switch "C" all the way to the right.

(d) When circular trace appears on screen, adjust knobs "D" and "E" to give sharp marker pulse on top of screen.

(e) Turn switch "C" to left.

(f) Set knobs "F" and "G" to minimum.

(g) Rotate each of the knobs "F" and "G" in turn slowly toward maximum until two groups of received pulse appears on screen.

(h) Turn switch "C" to its middle position and throw toggle switch to left of screen downward.

(i) When ready to use equipment, set switch "B" to extreme clockwise position.

(2) To stop equipment.—

(a) Press pushbutton "H." Pilot light should go on.

(b) In an emergency, the equipment may also be stopped by pressing pushbutton on transmitter panel.

g. SIGHTING STATION PERISCOPE ANTI-ICING.

(1) GENERAL.—The sighting station periscope anti-icing system, provided with a hand pump, is an independent system. Anti-icing fluid is supplied from a supply tank, capacity one U. S. gallon.

(2) HAND PUMP AND SELECTOR VALVE CONTROL.—The hand pump handle, located near the floor to the right of the gunner's seat (when the seat is in the forward position), is used as a selector valve to direct fluid to the desired sighting unit periscope, as well as a means of pumping anti-icing fluid to the periscope.

(3) FLUID QUANTITY GAGE STICK. — The fluid quantity dip stick, integral with the fluid supply tank, is the only means of determining the fluid quantity.

8. BOMBARDIER'S COMPARTMENT.

(Figure 52.) (A-26C AIRPLANES ONLY.)

a. GENERAL.—When using the bomb sight the bombardier kneels in front of his seat, and leans over protective armor plate.

b. BOMBING EQUIPMENT.—A cord type bomb release button and mounting provisions for a bomb sight and glide angle attachment, are provided in addition to the following:

(1) CONTROL PANEL.—The bombardier's control panel contains bomb control switches and indicator lights as shown on *11, figure 52.*

(2) INSTRUMENTS. — The bombardier is provided with flight instruments as shown on *figure 52.*

c. OPERATION.

(1) NORMAL RELEASE.—The bombardier can open and close the bomb bay doors in addition to releasing wing and fuselage bombs, but the selection of demolition or fragmentation bombs must be made by the pilot.

(a) Communicate with pilot by means of interphone.

(b) Request selection of bombs by pilot.

(c) Request bomb circuit power switch *(figure 9)* "ON."

(d) Bomb arming switch—Set to the desired arming position "NOSE AND TAIL" (impact) or "TAIL" (delayed).

(e) Bomb bay door switch "OPEN."

(f) Notify pilot of approaching target.

(g) If demolition bombs are carried, depress the bomb release button momentarily. This will automatically release bombs, depending upon counter dial control setting and the bomb release interval control setting. If fragmentation bombs are to be released, it is necessary to hold switch closed for the selected number of bombs to be released.

(h) Notify pilot that bombs have been released.

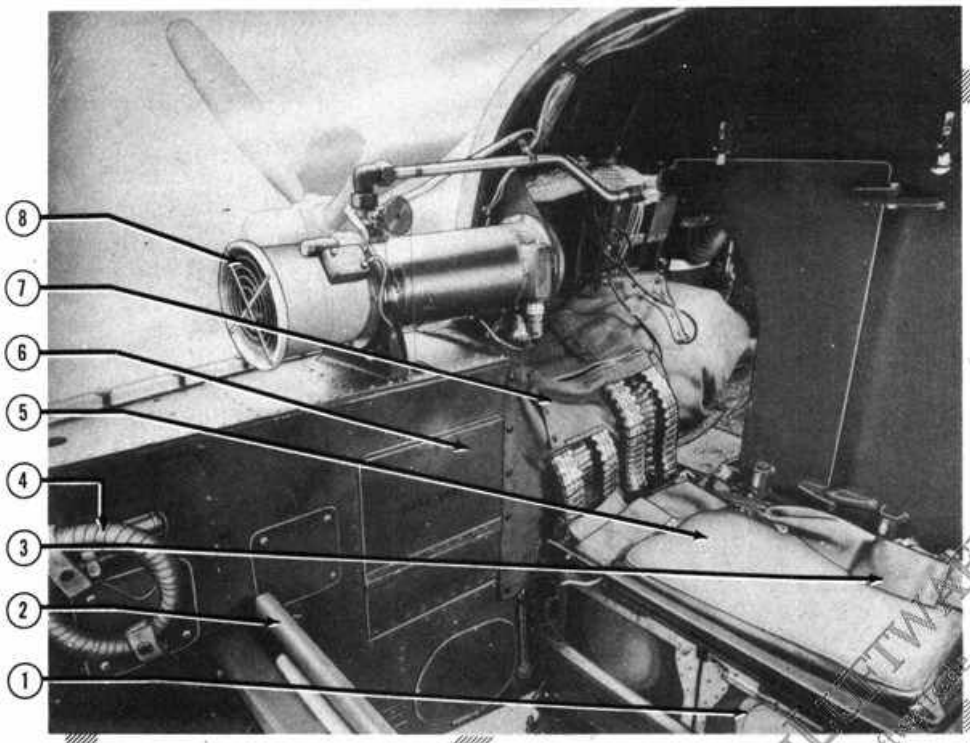
(i) Bomb bay door switch—"CLOSED."

(2) SALVO RELEASE.—The salvo switch provides for the release of all demolition bombs. Bombs may be dropped either safe or armed, depending on the position of the arming switch. To salvo the fragmentation bombs, it is first necessary to request the pilot to put all of the fragmentation bomb select train switches in the "TRAIN" position. The bombardier then holds the bomb release switch DOWN until the fragmentation bomb racks are empty.

d. BOMBARDIER'S WINDSHIELD WIPER. — A windshield wiper, in addition to the defroster system, is provided to clear the bombsight window. A switch, with "SLOW" and "FAST" positions, is located on the bombardier's control panel and operates the wiper.

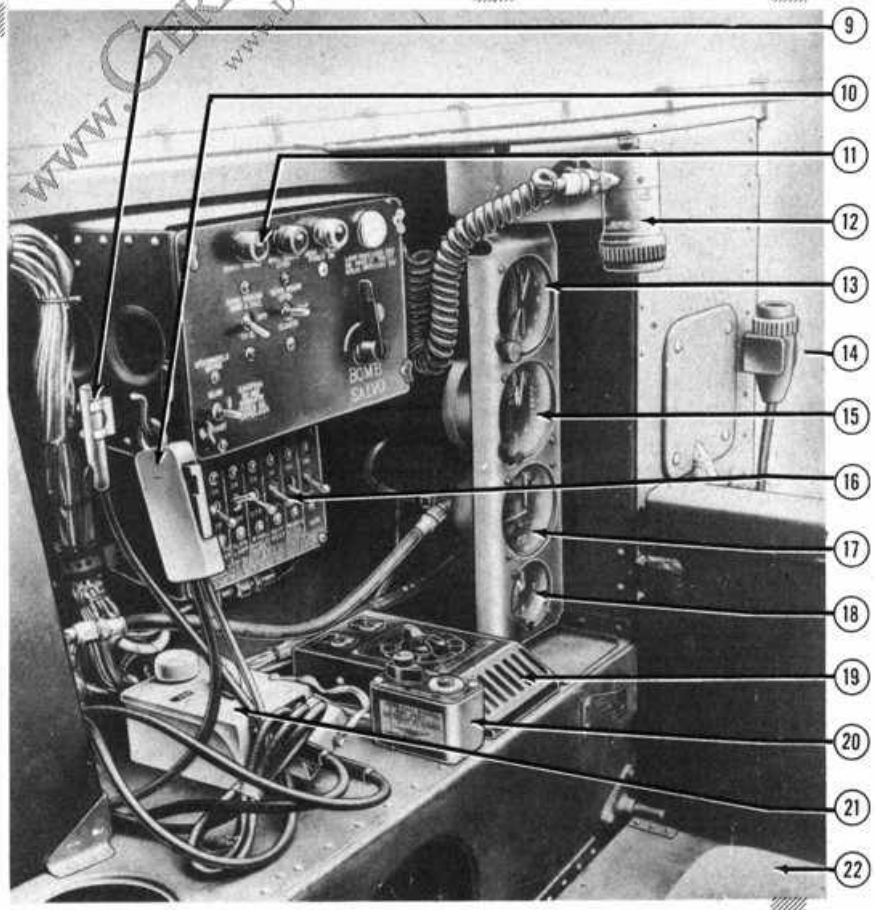
CAUTION

Do not operate wiper on dry glass.



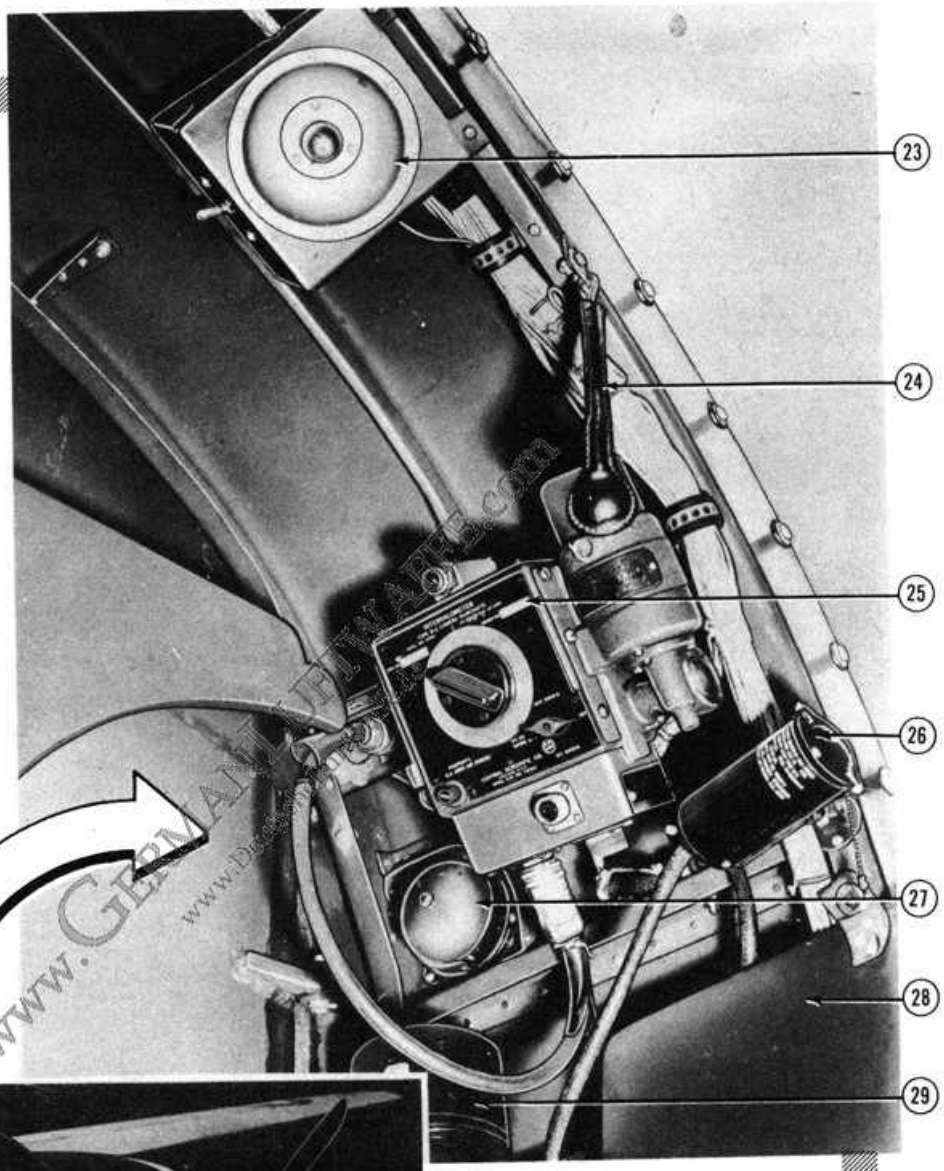
1. Ammunition Boxes
2. Bombardiers' Folding Floor
3. Bombardiers' Safety Belt
4. Heat Outlet Hose (Flexible)
5. Bombardiers' Seat Pad
6. Data Case
7. Cover (for Guns)
8. Recirculating Heater

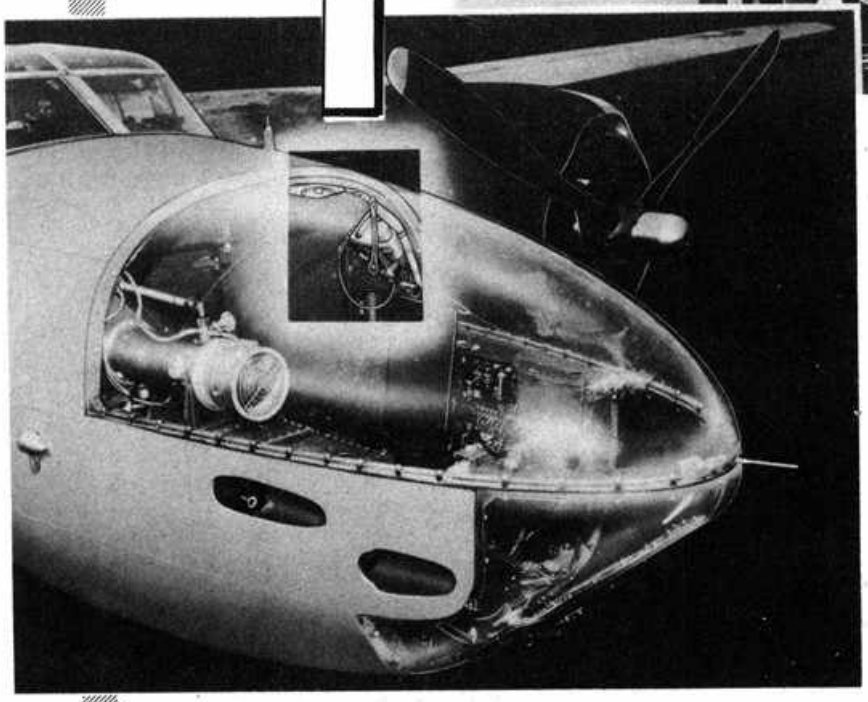
- STEWART-WARNER HEATER INSTALLATION SHOWN
- ANY OTHER TYPE HEATER INSTALLATIONS WOULD NOT APPEAR IN THESE VIEWS



9. Interphone Jack
10. Microphone Switch
11. Bombardiers' Control Panel
12. Fluorescent Instrument Light
13. Remote Compass Indicator
14. Bomb Release Control
15. Altimeter
16. Circuit Breaker Panel
17. Airspeed Indicator
18. Clock
19. Suit Heat Rheostat
20. Inter-Call Signal Box Assembly
21. Interphone Jack Box
22. Bombardiers' Kneeling Pad

Figure 52 (Sheet 1 of 2) — Bombardier's Compartment





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23. Dome Lamp
24. Entrance Assist Strap
25. Camera Intervalometer
26. Lamp
27. Alarm Bell
28. Data Board
29. Relief Container

Right hand exterior view of bombardier's compartment with detail of equipment not shown on preceding page

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Figure 52 (Sheet 2 of 2) — Bombardier's Compartment

SECTION VI
EXTREME WEATHER OPERATION

OPERATION

1. ARCTIC.

a. GENERAL.—The following operating procedure should be complied with when operating aircraft at outside temperature below freezing. See that the following has been accomplished.

(1) At temperatures below −18°C (−0.4°F), apply external heat to pilots' compartment, engine, accessory section, master brake cylinders, all actuating cylinders, and batteries.

(2) Remove pilot's enclosure, aft gunner's, engine, propeller, gun pitot tube, and periscope covers.

(3) Remove snow and ice from surfaces, control hinges, propellers, pitot tubes, and fuel and oil tank caps and vents.

(4) Clean shock struts of dirt and ice; check for proper inflation.

(5) Check "Y" drain and oil tank sump drain for full flow. Apply heat if flow is unsatisfactory.

(6) Use external power or the auxiliary power plant for operating all electrical and radio equipment.

(7) Check surface controls.

b. PRESTARTING.

(1) Remove engine covers and ground heaters.

(2) Remove oil immersion heaters.

(3) Pull propeller through 12 blades. If propellers cannot be pulled through by two men, apply more heat to engine.

Note

Drain lower cylinders if necessary.

(4) Connect external power supply.

(5) Do not prime engine until immediately before or during cranking.

c. STARTING ENGINE.

(1) Start engine in normal manner. (See paragraph 5, Section II.) More than normal priming is necessary before and after starting.

Note

Leave priming switch *(figure 10)* on for period of time necessary to give adequate supply of fuel to the engine. The actual amount of priming desirable for various weather conditions and degrees of engine temperature must be learned by experience.

(2) If there is no oil pressure after 30 seconds running, or if pressure drops after a few minutes ground operation, shut down and check for blown lines or coolers, and for congealed oil or ice at "Y" drain or oil tank sump drain.

(3) Oil may be diluted slightly if pressure is too high.

(4) Turn on carburetor heat *(14, figure 17)* approximately 1 minute after starting in order to assist vaporization and combustion and to reduce backfiring.

(6) Inspect all instruments for proper operation.

(7) Operate wing flaps *(13, figure 17)* through several cycles.

d. TAKE-OFF.

(1) Operate cowl flaps to maintain cylinder head temperatures within limitations on "Power Plant Chart" *(figure 25)*.

(2) Pack or remove loose snow from runway before take-off. If necessary, taxi airplane up and down runway to pack snow.

(3) Never turn on electrical equipment, except that absolutely needed, until generators show out-put.

(4) Use carburetor heat as required for smooth engine operation at all outside air temperature below −23°C (−9.4°F).

CAUTION

Excessive carburetor heat may cause detonation and dangerously reduced manifold pressure.

e. FLIGHT.

(1) At low outside air temperatures the fuel-air mixture may be too cold for proper vaporization. When flying in "CRUISING LEAN" apply sufficient carburetor heat to maintain carburetor air temperature just below or above icing range of −10°C to 15°C.

(2) Many flight instruments, especially the altimeters, airspeed indicators, the rate of climb indicator, sextants, watches, compasses, and the driftmeter, may be unreliable at extremely low temperatures.

f. LANDING.

(1) Place carburetor heat "ON" and close cowl flaps before landing. Be prepared to place carburetor heat "OFF" to obtain maximum power when it is necessary to go around again.

(2) Disconnect electric suits and all other electrical units not absolutely needed.

(3) Pump brake pedals several times.

(4) Open cowl flaps for all ground operations.

g. POST FLIGHT.

(1) If a temperature below 5°C (41°F) is anticipated to exist before the next engine start:

(a) Idle the engine (or allow the engine to remain inoperative) until the cylinder head temperature is less than 150°C and until the engine oil temperature is less than 50°C.

(b) With the engine idling at 800 to 900 rpm, hold the oil dilution switch *(figure 10)* "ON" as follows:

ANTICIPATED LOWEST OUTSIDE AIR TEMPERATURE	DILUTION TIME
4°C to −12°C	4 minutes
−12°C and lower	Dilute 4 minutes and use heat before next start.

Note

A drop in oil pressure indicates the oil dilution system is functioning.

(c) At the end of the oil dilution period, increase the engine speed to 2000 rpm. Move the propeller control slowly to "DECREASE RPM" in order to allow diluted oil to enter the propeller dome. Return the control to "INCREASE RPM" to obtain 2000 rpm. Repeat this procedure three times.

(d) Mixture control—"IDLE CUT-OFF" as soon as the oil is diluted as much as desired.

(e) Continue the oil dilution until the engine stops, then turn off all switches.

(f) If oil tanks must be serviced, split dilution period to provide dilution before and after servicing.

(g) Leave brakes in "OFF" position.

2. DESERT.

Dust clouds in the desert may be found at altitudes as high as 10,000 feet. On some airplanes, to diminish the chance of damage to the engine, two air filters are installed for each engine on the upper side segments of the anti-drag ring, one on each side of the structure. The filters should be used for all ground operations and in flight until the air is free from dust. They are controlled by a switch *(figure 9)* on the pilot's electrical control panel.

APPENDIX I — DIAGRAMS AND OPERATING CHARTS

1. ARMOR PLATE PROTECTION.

Crew members are protected from enemy shell fire by armor plate. Heavy dural plates are provided along the fuselage to deflect shrapnel gunfire. The angles of protection are graphically illustrated *(figures 53 and 54)*.

2. FLIGHT PLANNING.

The following pages contain charts to be used as a guide to flight planning. Charts provided are a Take-off, Climb, and Landing Chart; a set of Flight Operation Instruction Charts for two engine operation; and a set of Flight Operation Instruction Charts for single engine operation. Each set of charts covers the probable gross weight range for the stated configuration.

a. GENERAL.

(1) The methods of computing flight time, fuel requirements and range vary, depending upon the type of operation and mission planned. These instructions cannot possibly cover all the types of operation possible, but they do cover the more common types likely to be encountered: simple continuous flight at fairly constant power, and a bombing mission with allowances for combat operation.

(2) The Flight Operation Instruction Charts have been set up so that ranges in Column I are for Maximum Continuous (Normal Rated) Operation (which gives the maximum airspeed possible with an indefinite time limit on the engine), and so that progressively greater range is obtained from Column I to Column V with a corresponding decrease in airspeed.

(3) Within certain limits airspeed is obtained at a sacrifice in range, and in like manner, range is increased with a sacrifice in airspeed. It should be noted that the fuel required and the flying time for a given mission depend mainly upon the airspeed desired. By selecting a higher altitude, a higher true airspeed is obtained, and the flight time is shortened considerably. This will not affect the range, since all power settings listed within a column are set up to give approximately the same air miles per gallon at each altitude.

(4) The approximate airspeed desired is determined by weighing the urgency of the mission against the range required.

b. USE OF THE CHARTS.

(1) The simplest type of mission to plan is one in which the flight is continuous, and the desired cruising power and airspeed are to be reasonably constant. This is known as a "single stage flight." An example of this type of flight planning appears at the bottom of each Flight Operation Instruction Chart; however, the following general information may be of value:

(a) Assuming the range to be flown is known, choose the altitude at which the flight is to be made. The main factors in the choice of altitude are weather conditions, oxygen requirements, and the approximate true airspeed desired.

(b) Enter the Climb Data Chart *(figure 55)* at the chosen altitude and the approximate gross weight of the airplane before take-off, and read the fuel allowance to be made for climb to this operating altitude.

Note

Allowances have been made in the Climb Data Chart for warm-up and take-off as well as climb fuel consumption.

(c) Determine the fuel reserve desired and add this to the climb allowance. *No allowances have been made in the Flight Operation Instruction Charts for wind, navigational error, or other contingencies; and no allowances have been made for combat or formation flight. The allowances to be made for each of these items should be dictated by local doctrine.*

(d) Add the allowances made in *(b)* and *(c)*, and subtract this total allowance from the fuel available in the airplane prior to starting the engines. The result is the value to be used in entering the chart.

(e) Select the appropriate Flight Operation Instruction Chart corresponding to the approximate gross weight of the airplane before take-off.

(f) Enter the figure in the fuel column of the chart equal to (or just below) the amount of fuel determined in *(d)* to be available for flight.

(g) Read horizontally to the right or left and select a value equal to (or just above) the number of air miles (with no wind) to be flown.

(h) Move vertically down the column and opposite the altitude chosen, read the RPM, M.P., Blower Setting, and Mixture Setting required. The airplane may be flown using values contained under operating data in any column to the right; however, this will result in the flight plan being accomplished at a sacrifice in airspeed, but with an increase in fuel economy.

(2) A little more complex, but very common, type of operation is one in which the airplane weight during flight decreases below the lower weight limit of the chart due to the consumption of fuel, dropping of bombs, or both. When this occurs use the operating data under the same column of the next chart.

(a) When the weight change is due entirely to the consumption of fuel, the time (in hours) after take-off when this transition occurs may be found by dividing the difference between the take-off gross weight less weight of fuel consumed in warm-up, take-off, and climb and the weight at which the transition is to occur by six times the value in the GPH column. The gallons of fuel consumed is equal to the time multiplied by the gallons per hour, and the weight decrease is equal to six times the fuel consumption.

(b) When the weight change is due to both fuel consumption and the dropping of bombs, determine the weight of fuel consumed as in *(a)*, and add this to the weight of the bombs dropped. Subtract the total weight decrease from the take-off gross weight. Use the operating data under the same column of the appropriate chart corresponding to the new gross weight.

(c) When the flight is of long duration, make the change in operating data several times, i.e., whenever the weight decreases enough to bring the next chart into use.

(3) If the mission necessitates a flight plan requiring changes in engine power, airspeed, or gross weight; allowances for combat; or if one engine fails in flight, the total flight should be broken down into a series of single stage flights. Each of these single stage flights should be computed individually and then added together to determine the total flight and its requirements. An example of this type of complex flight planning follows.

c. EXAMPLE OF FLIGHT PLANNING.

(1) Data Available for Flight Planning:

Airplane Gross Weight: Approximately 35,000 lb.
Bomb Load: 4000 lb.
Fuel Load: 925 Gal. (5550 lb.)
Target and Combat Zone Distance: 500 mi.
Operating Altitude: 10,000 ft.
Fuel to Be Held in Reserve: 150 gal. (900 lb.)
Flight Procedure: Take-off and Climb to 10,000 ft. and cruise to target. Allow for 5 min. at War Emergency Power and 5 min. at Military Power (both in low blower) for combat over the target area. Cruise back to point of departure at 10,000 ft. Determine the operating conditions in the event of engine failure on the return flight.

(2) Determination of Flight Plan.

(a) The first thing to be determined is the actual fuel available for flight to the target and return to the home base. From the Climb Data Chart *(figure 55)*, it is found that 115 gallons are required for warm-up, take-off, and climb to 10,000 ft. As the flight procedure calls for a combat allowance for 5 min. each of low blower operation with War Emergency and Military Power, the fuel required is not available for cruising operation to and from the target. Reference to the top left corner of the Flight Operation Instruction Chart *(figure 56)* gives the fuel flow for War Emergency Power to be 520 gph. The fuel required is therefore (5/60) x (520) or 45 gal. In like manner, the combat allowance for Military Power is 50 gal. Thus, the total allowance is found to be (150 + 115 + 45 + 50) or 360 gal. The actual fuel available for flight planning is the fuel in the airplane prior to starting the engines minus the total allowances. This is found to be (925 — 360) or 565 gal. It should be remembered that more than half of the fuel will be consumed enroute to the target because the weight is greater than it will be on the return flight.

(b) Using the Flight Operation Instruction Chart for 35,000 lb. gross weight, opposite 600 gal. of fuel appears 945 mi. range in Column III and 1060 mi. in Column IV. These fuel-range numbers correspond roughly to those of the total flight. In the lower half of the columns opposite the operating altitude appear the respective approximate true airspeeds of 280 mph and 255 mph. Assuming the flight procedure to require the higher airspeed, operation must be made according to Column III. The power settings enroute to the target are thus 2100 rpm, 32 in. Hg M.P., auto lean mixture, and low blower at 10,000 ft. As 600 gal. is the lowest figure entered in the fuel column on this chart, the fuel required for the 500 mi. flight to the target must be calculated. Noting in the middle of the chart that Column III is based upon 1.58 mi/gal, the fuel required is found to be (500/1.58) or 315 gal. approx.

(c) In order to choose the proper chart to be used for the return flight, the gross weight of the airplane prior to beginning the return stage must be determined. This gross weight will be equal to the take-off gross weight minus the total decrease in weight due to the dropping of bombs and the consumption of fuel enroute to and over the target. The total fuel consumed is (115 + 315 + 45 + 50) or 525 gal, and its weight is 6 × 525 or 3150 lb. Thus, the new gross weight is (35,000 — 4000 — 3150) or 27,850 lb. Operation on the return flight should therefore be made according to the 29,000 lb. weight chart.

(d) The fuel available for the return stage of the flight is (565 — 315) or 250 gal. An examination of the 29,000 lb. chart reveals that operation will have to be made according to Column V. The airmiles given opposite fuel entries of 300 gal. and 200 gal. in the 10,000 ft. altitude column are 635 mi. and 425 mi. respectively. By interpolation it is found that 425 + (50/100) (635 — 425) or 530 mi. can be flown on 250 gal. The power settings are 1700 rpm, 24 in. Hg M.P., auto lean mixture, and low blower at 10,000 ft. This gives an approximate true airsped of 210 mph.

(3) Engine Failure on the Return Flight: The most critical time for engine failure on the return flight is obviously while still over the target, as all of the return flight must then be made with single-engine operating conditions. According to Column V of the 29,000 lb. Flight Operation Instruction Chart for Single Engine Operation *(Figure 57)*, 375 + (50/100) (560 — 375) or 465 mi. can be flown on 250 gal. of fuel. Although this is 35 mi. short of the necessary range required, it should be remembered that 150 gal. have been held in reserve for just such an emergency. As only about 20 gal. of the reserve will be needed, a safe return flight is assured on this basis. The power settings should be 2100 rpm, 34.5 in. Hg M.P., auto lean mixture, and low blower. The return trip *must* be made at 5000 ft. altitude or lower instead of 10,000 ft. in the event of single engine operation.

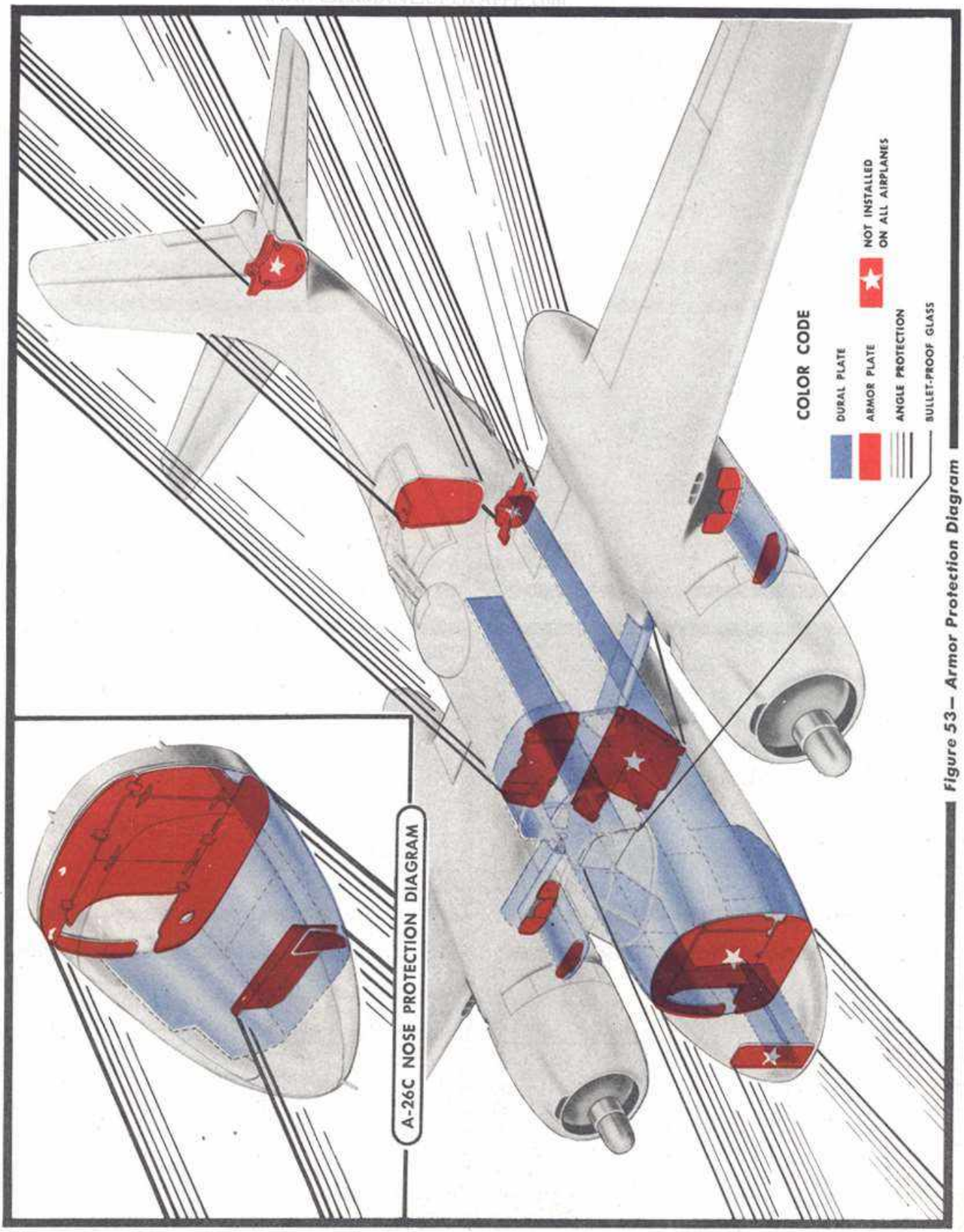

Figure 53— Armor Protection Diagram

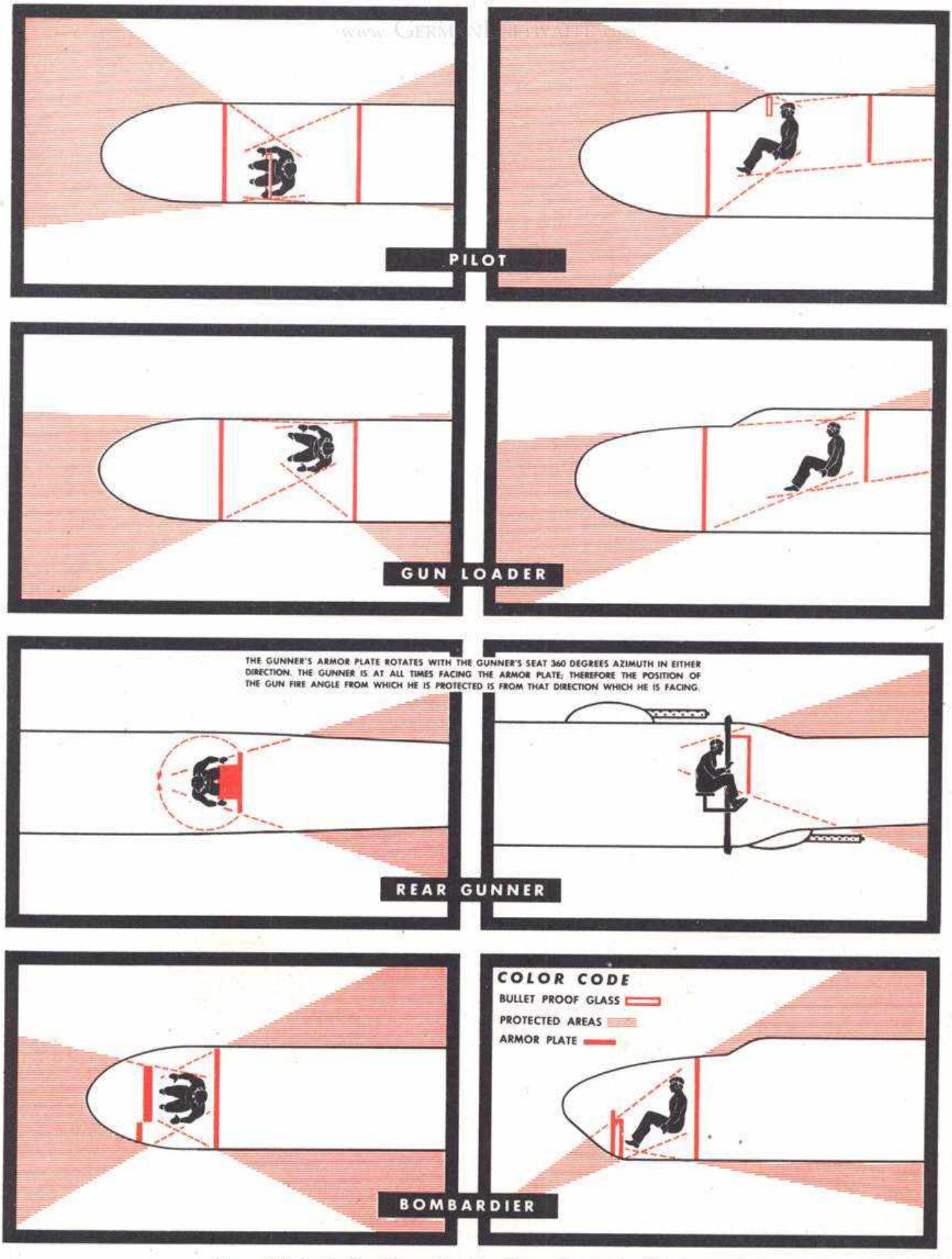

Figure 54– Individual Crew Member Armor Protection Diagram

AAFMC-527
4-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
CLEAN & FERRY CONFIGURATION

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S)
P. & W. R-2800-27,-71,&-79

TAKE-OFF DISTANCE FEET

GROSS WEIGHT LB.	HEAD WIND		HARD SURFACE RUNWAY						SOD-TURF RUNWAY						SOFT SURFACE RUNWAY					
			AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET	
	M.P.H.	KTS.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
38,000	0	0	4600	6800	5600	9100	7400	13,600	4850	7300	5750	9500	8100	16,500	5850	8500	7400	11,500	10,500	18,250
	20	17	3300	5350	4150	7000	5400	10,700	3550	5700	4550	7600	6050	11,600	4350	6450	5550	9050	7900	14,450
	40	35	2350	3950	2900	5250	3850	8250	2500	4300	3150	5600	4300	8450	3150	5100	3850	6750	5600	10,600
35,000	0	0	3650	5600	4450	7200	5800	10,400	3850	5900	4600	7550	6300	12,200	4600	6950	5750	9000	8050	13,650
	20	17	2650	4350	3250	5600	4250	8150	2800	4550	3550	5900	4650	8550	3350	5150	4250	6950	5900	10,650
	40	35	1800	3150	2200	4150	2900	6100	1900	3350	2400	4350	3150	6400	2300	3900	2850	5100	4000	7900
32,000	0	0	2850	4450	3450	5550	4450	7550	3050	4650	3700	5650	4800	7900	3450	5150	4350	6600	5900	9250
	20	17	2050	3400	2450	4150	3200	5750	2150	3550	2650	4350	3450	6000	2450	3950	3150	4950	4250	7000
	40	35	1350	2450	1600	3000	2100	4200	1400	2550	1750	3150	2250	4400	1700	2850	2050	3600	2800	5050
29,000	0	0	2200	3550	2600	4350	3400	5650	2350	3650	2800	4500	3650	6000	2600	4150	3250	5000	4350	6800
	20	17	1550	2650	1850	3200	2400	4300	1650	2750	1950	3250	2550	4700	1850	3250	2300	3750	3050	4800
	40	35	1000	1900	1200	2300	1500	3200	1050	1900	1250	2600	1600	3250	1150	2200	1450	2650	1950	3650

NOTE: INCREASE CHART DISTANCES AS FOLLOWS: 75°F + 10%; 100°F + 20%; 125°F + 30%; 150°F + 40%
DATA AS OF 6 NOV. 1944 BASED ON: FLIGHT TESTS

OPTIMUM TAKE-OFF WITH 2700 RPM, 52 IN.HG. & 20 DEG. FLAP IS 80% OF CHART VALUES

CLIMB DATA

GROSS WEIGHT LB.	AT SEA LEVEL				AT 5000 FEET					AT 10,000 FEET					AT 15,000 FEET					AT 20,000 FEET					AT 25,000 FEET					ALTITUDE OF BLOWER SHIFT FT.
	BEST I.A.S. MPH	BEST I.A.S. KTS	RATE OF CLIMB F.P.M.	GAL. OF FUEL USED	BEST I.A.S. MPH	BEST I.A.S. KTS	RATE OF CLIMB F.P.M.	FROM SEA LEVEL TIME MIN.	FROM SEA LEVEL FUEL USED GAL.	BEST I.A.S. MPH	BEST I.A.S. KTS	RATE OF CLIMB F.P.M.	FROM SEA LEVEL TIME MIN.	FROM SEA LEVEL FUEL USED GAL.	BEST I.A.S. MPH	BEST I.A.S. KTS	RATE OF CLIMB F.P.M.	FROM SEA LEVEL TIME MIN.	FROM SEA LEVEL FUEL USED GAL.	BEST I.A.S. MPH	BEST I.A.S. KTS	RATE OF CLIMB F.P.M.	FROM SEA LEVEL TIME MIN.	FROM SEA LEVEL FUEL USED GAL.	BEST I.A.S. MPH	BEST I.A.S. KTS	RATE OF CLIMB F.P.M.	FROM SEA LEVEL TIME MIN.	FROM SEA LEVEL FUEL USED GAL.	
38,000	180	156	1200	65	180	156	1040	4.5	95	173	150	810	10	130	168	146	500	17	180											6700
35,000	177	154	1440	65	175	152	1270	3.5	90	170	148	1050	8	115	165	143	760	13.5	155	155	135	300	23.5	195						6700
32,000	174	151	1680	65	170	148	1510	3	85	168	146	1280	7	105	162	141	970	11	140	152	132	490	18	170						6700
29,000	170	148	1960	65	165	143	1780	2.5	80	165	143	1540	6	100	160	139	1220	9.5	125	150	130	710	14.5	150	140	120	200	26.5	180	6700

POWER PLANT SETTINGS: (DETAILS ON FIG. 25 SECTION III): 2400 RPM, 42 IN. Hg M.P.
DATA AS OF 2 OCT. 1944 BASED ON: FLIGHT TESTS

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

LANDING DISTANCE FEET

GROSS WEIGHT LB.	BEST IAS APPROACH				HARD DRY SURFACE						FIRM DRY SOD						WET OR SLIPPERY					
	POWER OFF		POWER ON		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET	
	MPH	KTS	MPH	KTS	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.
30,000			130	110	2100	3750	2250	4050	2500	4400	2350	4000	2550	4350	2800	4700	5300	6950	5800	7600	6350	8300
25,000			115	100	1750	3200	1900	3450	2050	3750	1950	3400	2150	3700	2300	4000	4400	5850	4850	6400	5300	6950

DATA AS OF 6 NOV. 1944 BASED ON: FLIGHT TESTS

WITH FLAPS FULL DOWN

OPTIMUM LANDING IS 80% OF CHART VALUES

REMARKS:

INDICATED AIRSPEEDS GIVEN ARE CORRECTED & ARE NOT PILOT'S INDICATOR AIRSPEED READINGS. FOR CORRECTION, SEE AIRSPEED CORRECTION CHART, FIGURE 24.

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

LEGEND
I.A.S. : INDICATED AIRSPEED
M.P.H. : MILES PER HOUR
KTS. : KNOTS
F.P.M. : FEET PER MINUTE

Figure 55 — Take-Off, Climb and Landing Chart

AAFMC-528
4-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
CLEAN CONFIGURATION
ENGINE(S): P&W R-2800-27,-71,&-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 35,000 TO 32,000 POUNDS

EXTERNAL LOAD ITEMS
NONE
NUMBER OF ENGINES OPERATING: 2

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY POWER	2700	52	LOW	A.R.	5 MIN	260°C	580
	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I						FUEL	COLUMN II						COLUMN III						COLUMN IV						FUEL	COLUMN V			
RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES						RANGE IN AIRMILES						RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES			
STAUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL	
						1600	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																		1600	S.L.	10,000	S.L.	10,000
1260		1095				1535	1865		1620				2415		2100				2715		2355				1535	2925	3045	2530	2635
1230		1070				1500	1820		1580				2360		2050				2655		2305				1500	2865	2980	2485	2590
1150		1000				1400	1700		1480				2205		1915				2480		2150				1400	2665	2770	2310	2405
1070		930				1300	1580		1370				2045		1780				2300		1995				1300	2460	2555	2135	2220
985		855				1200	1460		1265				1890		1640				2125		1840				1200	2260	2345	1960	2035
905		785				1100	1340		1160				1730		1505				1950		1690				1100	2060	2130	1790	1850
820		715				1000	1215		1055				1575		1370				1770		1535				1000	1860	1920	1610	1665
740		640				900	1095		950				1420		1230				1590		1380				900	1665	1720	1445	1490
660		570				800	970		845				1260		1095				1415		1230				800	1475	1520	1280	1320
575		500				700	850		740				1100		955				1240		1075				700	1285	1325	1115	1150
495		430				600	730		635				945		820				1060		920				600	1095	1125	950	975
MAXIMUM CONTINUOUS						PRESS	(1.22 STAT. (1.05 NAUT.) MI./GAL.)						(1.58 STAT. (1.37 NAUT.) MI./GAL.)						(1.77 STAT. (1.54 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE			
R.P.M.	M.P. INCHES HG.	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG.	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG.	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG.	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG.	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
2400	F.T.	A.R.	195	290	255	25000							2350	F.T.	A.R.	180	285	245							25000						
2400	F.T.	A.R.	285	330	285	20000	2300	F.T.	A.R.	265	320	280	2150	29	A.R.	185	285	250	2000	F.T.	A.L.	145	260	225	20000						
2400	42	A.R.	420	345	300	15000	2200	34	A.R.	255	305	265	2100	32.5	A.L.	175	280	245	2100	F.T.	A.L.	155	270	235	15000	1950	F.T.	A.L.	135	250	215
2400	42	A.R.	400	325	280	10000	2200	33.5	A.R.	250	305	265	2100	32	A.L.	180	280	245	1950	29	A.L.	145	255	220	10000	1850	27	A.L.	125	230	200
2400	42	A.R.	390	325	280	5000	2200	34.5	A.R.	240	285	250	2050	32.5	A.L.	170	265	230	1900	30	A.L.	130	235	200	5000	1850	28	A.L.	115	215	185
2400	42	A.R.	370	305	265	S.L.	2150	34.5	A.R.	220	270	235	2000	33	A.L.	155	245	215	1850	30.5	A.L.	120	210	185	S.L.	1800	29.5	A.L.	110	200	170

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE TAKE-OFF, CLIMB, & LANDING CHART) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 35,000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 115 GAL.) TO FLY 1260 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 2100 RPM AND 32 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN, LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 32,000 LB, THEN USE COLUMN III OF NEXT CHART.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 OCT. 1944 BASED ON: FLIGHT TESTS

Figure 56 (Sheet 1 of 3) — Flight Operation Instruction Chart

AAFMC-528
4-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
CLEAN CONFIGURATION
ENGINE(S): P&W. R-2800-27,-71, & -79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 32,000 TO 29,000 POUNDS

EXTERNAL LOAD ITEMS
NONE
NUMBER OF ENGINES OPERATING: 2

LIMITS	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
EMERG.	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY	2700	52	LOW	A.R.	5 MIN	260°C	580
POWER	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[1]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I			FUEL	COLUMN II			COLUMN III			COLUMN IV			FUEL	COLUMN V			
RANGE IN AIRMILES			U.S.	RANGE IN AIRMILES			RANGE IN AIRMILES			RANGE IN AIRMILES			U.S.	RANGE IN AIRMILES			
STAUTE		NAUTICAL	GAL.	STATUTE		NAUTICAL	STATUTE		NAUTICAL	STATUTE		NAUTICAL	GAL.	STATUTE		NAUTICAL	
							SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							S.L.	10,000	S.L.	10,000
1070		930	1300	1580		1370	2045		1780	2300		1995	1300	2565	2690	2225	2340
985		855	1200	1460		1265	1890		1640	2125		1840	1200	2365	2480	2055	2155
905		785	1100	1340		1160	1730		1505	1950		1690	1100	2160	2265	1880	1970
820		715	1000	1215		1055	1575		1370	1770		1535	1000	1960	2055	1700	1785
740		640	900	1095		950	1420		1230	1590		1380	900	1760	1840	1530	1600
660		570	800	970		845	1260		1095	1415		1230	800	1560	1630	1350	1415
575		500	700	850		740	1100		955	1240		1075	700	1355	1415	1180	1230
495		430	600	730		635	945		820	1060		920	600	1155	1205	1005	1045
410		355	500	605		525	785		685	885		770	500	955	990	830	860
330		285	400	485		420	630		550	710		615	400	765	795	665	690
245		215	300	364		315	470		410	530		460	300	575	595	500	515

MAXIMUM CONTINUOUS						PRESS	(1.22 STAT. (1.05 NAUT.) MI./GAL.)						(1.58 STAT. (1.37 NAUT.) MI./GAL.)						(1.77 STAT. (1.54 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	F.T.	A.R.	285	335	290	20000	2350	F.T.	A.R.	275	330	285	2100	F.T.	A.R.	190	305	265	2100	F.T.	A.L.	160	290	250	20000						
2400	42	A.R.	420	350	300	15000	2200	34.5	A.R.	260	315	275	2100	32.5	A.L.	175	290	250	2100	F.T.	A.L.	155	280	245	15000	1850	F.T.	A.L.	120	240	205
2400	42	A.R.	400	325	285	10000	2200	34	A.R.	255	310	270	2100	32	A.L.	180	290	250	2000	30	A.L.	155	270	235	10000	1800	26	A.L.	110	220	190
2400	42	A.R.	390	325	285	5000	2200	34.5	A.R.	240	290	250	2100	33	A.L.	175	290	235	1950	30.5	A.L.	140	250	215	5000	1750	27	A.L.	105	205	175
2400	42	A.R.	370	310	270	S.L.	2150	35.5	A.R.	225	275	235	2050	33	A.L.	160	250	220	1900	31.5	A.L.	130	230	200	S.L.	1700	28	A.L.	100	190	165

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP TAKE-OFF & CLIMB (SEE TAKE-OFF, CLIMB & LANDING CHART) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 32,000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 105 GAL.) TO FLY 970 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 2200 RPM AND 34 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH, LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 29,000 LB, THEN USE COLUMN II OF NEXT CHART.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 OCT. 1944 BASED ON: FLIGHT TESTS

Figure 56 (Sheet 2 of 3) — Flight Operation Instruction Chart

AAFMC-528
4-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
CLEAN CONFIGURATION
ENGINE(S): P&W R-2800-27,-71 & -79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 29,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS
NONE
NUMBER OF ENGINES OPERATING: 2

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
EMERG.	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY	2700	52	LOW	A.R.	5 MIN	260°C	580
POWER	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN **FUEL** COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT **RANGE** VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (**ALT.**) READ RPM, MANIFOLD PRESSURE (**M.P.**) AND **MIXTURE** SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN **BRITISH IMPERIAL GAL.** (OR **G.P.H.**): MULTIPLY **U.S. GAL.** (OR **G.P.H.**) BY 10 THEN DIVIDE BY 12.

COLUMN I						FUEL	COLUMN II						COLUMN III						COLUMN IV						FUEL	COLUMN V					
RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES						RANGE IN AIRMILES						RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES					
STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
							SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																			S.L.	10,000	S.L.	10,000		
						925																			925						
740		640				900	1095		950				1420		1230				1590		1380				900	1810	1910	1570	1660		
660		570				800	970		845				1260		1095				1415		1230				800	1610	1700	1395	1475		
575		500				700	850		740				1100		955				1240		1075				700	1410	1490	1220	1290		
495		430				600	730		635				945		820				1060		920				600	1205	1275	1050	1110		
410		355				500	605		525				785		685				885		770				500	1005	1060	875	925		
330		285				400	485		420				630		550				710		615				400	805	850	700	740		
245		215				300	365		315				470		410				530		460				300	605	635	525	555		
165		145				200	245		210				315		273				355		305				200	400	425	350	370		
80		70				100	120		105				160		135				175		155				100	200	210	175	185		
MAXIMUM CONTINUOUS						PRESS	(1.22 STAT. (1.05 NAUT.) MI./GAL.)						(1.58 STAT. (1.37 NAUT.) MI./GAL.)						(1.77 STAT. (1.54 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES HG	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	F.T.	A.R.	285	340	295	20000	2350	F.T.	A.R.	275	335	290	2150	F.T.	A.R.	200	315	270	2100	F.T.	A.L.	180	300	260	20000						
2400	42	A.R.	420	350	305	15000	2250	34.5	A.R.	265	320	275	2200	F.T.	A.R.	190	305	265	2100	F.T.	A.L.	155	290	255	15000	1750	23.5	A.L.	105	230	195
2400	42	A.R.	400	330	285	10000	2200	34	A.R.	255	315	270	2100	32.5	A.L.	190	295	260	2000	30	A.L.	155	280	240	10000	1700	24	A.L.	100	210	180
2400	42	A.R.	390	330	285	5000	2200	34.5	A.R.	240	295	255	2100	33	A.L.	175	275	240	1950	31	A.L.	145	255	225	5000	1700	25.5	A.L.	95	195	170
2400	42	A.R.	370	310	270	S.L.	2150	36	A.R.	230	275	240	2050	33	A.L.	160	255	275	1900	32	A.L.	135	235	205	S.L.	1650	26.5	A.L.	90	180	155

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE TAKE-OFF, CLIMB & LANDING CHART) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 29,000 LB. GROSS WEIGHT WITH 400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 80 GAL.) TO FLY 710 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 1950 RPM AND 31 IN. MANIFOLD PRESSURE WITH MIXTURE SET: **AUTO LEAN, LOW BLOWER**

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 OCT. 1944 BASED ON: FLIGHT TESTS

Figure 56 (Sheet 3 of 3) — Flight Operation Instruction Chart

AAFMC-528
6-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
CLEAN CONFIGURATION
ENGINE(S): P&W. R-2800-27, -71, & -79

FLIGHT OPERATION INSTRUCTION CHART
SINGLE ENGINE OPERATION
CHART WEIGHT LIMITS: 32,000 TO 29,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER
NUMBER OF ENGINES OPERATING: 1

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	F.T.	LOW	A.R.	5 MIN	260°C	268
	2700	F.T.	HIGH	A.R.	5 MIN	260°C	250
MILITARY POWER	2700	52	LOW	A.R.	5 MIN	260°C	290
	2700	47	HIGH	A.R.	5 MIN	260°C	270

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
1445	*1255*	1300							1300	2100	*1910*
1330	*1150*	1200							1200	1920	*1750*
1215	*1055*	1100							1100	1835	*1590*
1100	*955*	1000							1000	1645	*1430*
985	*855*	900							900	1460	*1265*
870	*755*	800							800	1270	*1105*
760	*655*	700							700	1085	*940*
640	*560*	600							600	900	*780*
530	*460*	500							500	715	*620*
425	*370*	400							400	570	*495*
315	*270*	300							300	430	*370*

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(STAT. (NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	42	A.R.	210	215	185	15000																			15000						
2400	42	A.R.	200	210	180	10000																			10000						
2400	42	A.R.	195	230	200	5000																			5000	2250	36	A.R.	135	190	165
2400	42	A.R.	185	215	185	S.L.																			S.L.	2200	36	A.R.	120	175	153

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR FUEL CONSUMED PRIOR TO ENGINE FAILURE.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.
(3) RANGES & SPEEDS GIVEN ABOVE ARE BASED UPON OPERATING ENGINE COWL FLAPS SET 6/8 OPEN & OIL COOLER DOOR 8 OPEN. RANGES GREATER THAN THOSE SHOWN ARE ATTAINABLE IF COWL FLAPS & OIL COOLER DOOR CAN BE FURTHER CLOSED WITHOUT EXCEEDING COOLING LIMITS. COWL FLAPS & OIL COOLER DOOR MUST BE FULLY CLOSED ON DEAD ENGINE.

DATA AS OF 1 OCT. 1944 BASED ON: FLIGHT TESTS

EXAMPLE

AT 32,000 LB. GROSS WEIGHT WITH 500 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 715 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2250 RPM AND 36 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH, LOW BLOWER

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

Figure 57 (Sheet 1 of 2) — Flight Operation Instruction Chart

AAFMC-528 8-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
CLEAN CONFIGURATION
ENGINE(S): P. & W. R-2800-27, -71 & -79

FLIGHT OPERATION INSTRUCTION CHART
SINGLE ENGINE OPERATION
CHART WEIGHT LIMITS: 29,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER
NUMBER OF ENGINES OPERATING: 1

LIMITS	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	F.T.	LOW	A.R.	5 MIN	260°C	268
	2700	F.T.	HIGH	A.R.	5 MIN	260°C	250
MILITARY POWER	2700	52	LOW	A.R.	5 MIN	260°C	290
	2700	47	HIGH	A.R.	5 MIN	260°C	270

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[1]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I					FUEL	COLUMN II						COLUMN III						COLUMN IV						FUEL	COLUMN V				
RANGE IN AIRMILES					U.S.	RANGE IN AIRMILES						RANGE IN AIRMILES						RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES				
STAUTE		NAUTICAL			GAL.	STATUTE		NAUTICAL				STATUTE*		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL		
SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																													
1035		900			900	1460		1265																900	1680		1460		
915		790			800	1295		1125																800	1490		1295		
795		690			700	1130		985																700	1305		1130		
685		595			600	970		845																600	1120		970		
570		495			500	810		705																500	930		810		
455		400			400	650		560																400	745		650		
340		295			300	485		420																300	560		485		
230		200			200	325		280																200	375		325		
110		95			100	160		140																100	185		160		
MAXIMUM CONTINUOUS					PRESS	(1.62 STAT. (1.40 NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE				
R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES HG	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000	POWER PLANT CHART LIMITS MAY BE EXCEEDED IN SINGLE ENGINE EMERGENCIES PROVIDED LIMITS GIVEN BELOW ARE OBSERVED.						
2400	42	A.R.	210	240	205	25000 20000 15000																			25000 20000 15000						
2400	42	A.R.	200	225	195	10000	2200	33	A.R.	120	195	170													10000						
2400	42	A.R.	195	235	205	5000	2200	34.5	A.R.	120	195	170													5000	2100	34.5	A.L.	95	175	155
2400	42	A.R.	185	220	195	S.L.	2200	36	A.R.	120	190	165													S.L.	2100	35	A.L.	90	170	145

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR FUEL CONSUMED PRIOR TO ENGINE FAILURE.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.
(3) RANGES & SPEEDS GIVEN ABOVE ARE BASED UPON OPERATING ENGINE COWL FLAPS SET 6° (6 OPEN) & OIL COOLER DOOR 6 OPEN. RANGES GREATER THAN THOSE SHOWN ARE ATTAINABLE IF COWL FLAPS & OIL COOLER DOOR CAN BE FURTHER CLOSED WITHOUT EXCEEDING COOLING LIMITS. COWL FLAPS & OIL COOLER DOOR MUST BE FULLY CLOSED ON DEAD ENGINE.

DATA AS OF 1 OCT. 1944 BASED ON: FLIGHT TESTS

EXAMPLE

AT 29,000 LB. GROSS WEIGHT WITH 500 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 250 GAL.) TO FLY 810 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 2200 RPM AND 33 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH, LOW BLOWER.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

Figure 57 (Sheet 2 of 2) — Flight Operation Instruction Chart

AAFMC-528 4-1-46

AIRCRAFT MODEL (S)
A-26B & A-26C
COMBAT & FERRY CONFIGURATION
ENGINE (S): P&W R-2800-27-71 & 79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS **38000** TO **35000** POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION

NUMBER OF ENGINES OPERATING 2

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY POWER	2700	52	LOW	A.R.	5 MIN	260°C	580
	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[1]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I RANGE IN AIRMILES STATUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
		2035[3]	← MAIN, AUX., BOMB BAY AUX., AFT FUSELAGE, FERRY FUEL & DROPPABLE WING TANKS →						2035[3]	S.L. 10,000	S.L. 10,000
1485	1290	1970	2365	2030	2860	2480			1970	3410 3515	2960 3050
1435	1245	1900	2280	1960	2755	2390			1900	3275 3380	2840 2930
1360	1180	1800	2160	1855	2610	2270			1800	3085 3180	2680 2760
		1725[3]	← MAIN, AUXILIARY, BOMB BAY AUXILIARY, AFT FUSELAGE, & FERRY FUEL TANKS →						1725[3]		
1285	1115	1700	2040	1750	2465	2140			1700		
1255	1090	1660	1990	1710	2405	2090			1660	2895 2985	2515 2590
		1600[3]	← MAIN, AUXILIARY, BOMB BAY AUXILIARY, & FERRY FUEL TANKS →						1600[3]	2820 2905	2450 2520
1160	1005	1535	1840	1580	2225	1935			1535	2585 2655	2245 2305
1130	985	1500	1800	1545	2175	1890			1500	2520 2590	2180 2250
1055	915	1400	1680	1440	2030	1765			1400	2340 2405	2030 2085
		1360[3]	← MAIN, AUXILIARY, BOMB BAY AUXILIARY, AFT FUSELAGE & DROPPABLE WING TANKS →						1360[3]		
980	850	1295	1555	1350	1880	1630			1295	2150 2210	1870 1920
905	785	1200	1440	1250	1740	1510			1200	1980 2035	1720 1765
830	720	1100	1320	1145	1595	1380			1100	1805 1850	1565 1605
		1050[3]	← MAIN, AUXILIARY, BOMB BAY AUXILIARY, & AFT FUSELAGE TANKS →						1050[3]		
755	655	1000	1200	1040	1450	1260			1000	1625 1665	1410 1445
745	645	985	1180	1025	1430	1240			985	1600 1635	1390 1420
		925[3]	← MAIN, AUXILIARY & BOMB BAY AUXILIARY TANKS →						925[3]		
680	590	900	1080	935	1305	1130			900	1460 1490	1265 1295

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(1.20 STAT. (1.04 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(1.45 STAT. (1.26 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
						25000																				25000						
						20000																				20000						
2400	42	A.R.	410	315	275	15000	2200	33	A.R.	225	270	235	2100	33	A.L.	170	255	220								15000	2100	F.T.	A.L.	150	240	210
2400	42	A.R.	390	295	255	10000	2150	32.5	A.R.	225	270	235	2100	32	A.L.	180	255	220								10000	1950	29	A.L.	140	225	195
2400	42	A.R.	380	290	250	5000	2150	33.5	A.R.	210	255	220	2050	32.5	A.L.	165	240	205								5000	1900	30	A.L.	130	205	180
2400	42	A.R.	360	275	240	S.L.	2100	34.5	A.R.	200	240	210	2100	33	A.L.	155	225	195								S.L.	1900	32	A.L.	130	200	175

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 55) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.
(3) ALTERNATE MAXIMUM FUEL CAPACITIES.

EXAMPLE

AT 38,000 LB. GROSS WEIGHT WITH 900 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 95 GAL.) TO FLY 1080 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2150 RPM AND 33.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 35,000 LB. THEN USE COLLUMN II OF NEXT CHART.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 5 JUNE 1945 BASED ON: FLIGHT TEST & FULL SCALE TUNNEL DATA

Figure 58 (Sheet 1 of 4)—Flight Operation Instruction Chart

WAR MODIFICATION AAFMO-528 4-1-44

AIRCRAFT MODEL(S)
A-26B & A-26C
COMBAT & FERRY CONFIGURATION
ENGINE(S): P & W R-2800-27, -71, & -79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS 35000 TO 32000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION

NUMBER OF ENGINES OPERATING: 2

LIMITS	RPM.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
EMERG.	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY	2700	52	LOW	A.R.	5 MIN	260°C	580
POWER	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S.GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I RANGE IN AIRMILES STATUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
1335	1160	1770	2125	1840	2565	2230	2920	2530	1770	S.L. 10,000	S.L. 10,000
		1725(3)	MAIN, AUXILIARY, BOMB BAY AUXILIARY, AFT FUSELAGE & FERRY FUEL TANKS						1725(3)	3195 3310	2770 2875
1285	1115	1700	2040	1750	2465	2140	2805	2420	1700	3060 3170	2660 2750
1255	1090	1660	1990	1710	2405	2090	2740	2365	1660	2985 3090	2595 2680
		1600(3)	MAIN, AUXILIARY, BOMB BAY AUXILIARY, & FERRY FUEL TANKS						1600(3)		
1160	1005	1535	1840	1580	2225	1935	2530	2190	1535	2750 2845	2385 2470
1130	985	1500	1800	1545	2175	1890	2470	2140	1500	2680 2775	2330 2410
1055	915	1400	1680	1440	2030	1765	2310	1995	1400	2490 2580	2160 2240
		1360(3)	MAIN, AUXILIARY, BOMB BAY AUXILIARY, AFT FUSELAGE & DROPPABLE WING TANKS						1360(3)		
980	850	1295	1555	1350	1880	1630	2140	1855	1295	2290 2370	1990 2060
905	785	1200	1440	1250	1740	1510	1980	1720	1200	2110 2180	1830 1895
830	720	1100	1320	1145	1595	1380	1815	1575	1100	1920 1985	1670 1725
		1050(3)	MAIN, AUXILIARY, BOMB BAY AUXILIARY, & AFT FUSELAGE TANKS						1050(3)		
755	655	1000	1200	1040	1450	1260	1650	1430	1000	1730 1790	1505 1550
745	645	985	1180	1025	1430	1240	1625	1410	985	1705 1760	1480 1530
		925(3)	MAIN, AUXILIARY, & BOMB BAY AUXILIARY TANKS						925(3)		
680	590	900	1080	935	1305	1130	1485	1290	900	1555 1605	1350 1390
650	565	860	1030	885	1250	1085	1420	1225	860	1480 1530	1285 1325
605	525	800	960	835	1160	1005	1320	1145	800	1375 1420	1195 1230
530	460	700	840	730	1015	880	1155	1000	700	1195 1235	1040 1070

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(1.20 STAT. (1.04 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(1.45 STAT. (1.26 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(1.65 STAT. (1.43 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES Hg	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
						25000																				25000						
2400	F.T.	A.R.	280	300	260	20000	2300	F.T.	A.R.	250	295	255	2100	F.T.	A.R.	185	270	235	2100	F.T.	A.L.	155	255	220	20000							
2400	42	A.R.	410	320	280	15000	2200	33.5	A.R.	235	275	240	2200	F.T.	A.R.	185	265	230	2100	F.T.	A.L.	150	250	220	15000	1950	F.T.	A.L.	130	225	195	
2400	42	A.R.	390	295	255	10000	2200	33	A.R.	230	275	240	2100	32.5	A.L.	185	265	230	2000	29.5	A.L.	145	240	210	10000	1900	30	A.L.	130	220	190	
2400	42	A.R.	380	295	255	5000	2150	34	A.R.	215	260	225	2100	33	A.L.	170	245	215	1950	30.5	A.L.	135	220	190	5000	1850	28.5	A.L.	115	200	175	
2400	42	A.R.	360	280	240	S.L.	2100	35	A.R.	200	240	210	2100	33	A.L.	155	225	195	1900	31.5	A.L.	125	205	175	S.L.	1850	30.5	A.L.	115	195	170	

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 55) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.
(3) ALTERNATE MAXIMUM FUEL CAPACITIES.

EXAMPLE

AT 35,000 LB. GROSS WEIGHT WITH 1000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 115 GAL.) TO FLY 1790 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 1900 RPM AND 30 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN, LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 32,000 LB, THEN USE COLUMN V OF NEXT CHART.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 5 JUNE 1945 BASED ON: FLIGHT TEST & FULL SCALE TUNNEL DATA

Figure 58 (Sheet 2 of 4)—Flight Operation Instruction Chart

AAFMC-520 4-1-46

AIRCRAFT MODEL(S)
A-26B & A-26C
COMBAT & FERRY CONFIGURATION
ENGINE(S): P. & W. R-2800-27, -71, & -79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 32,000 TO 29,000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION
NUMBER OF ENGINES OPERATING: 2

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY POWER	2700	52	LOW	A.R.	5 MIN	260°C	580
	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING. MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ R.P.M., MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND). TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I						FUEL	COLUMN II						COLUMN III						COLUMN IV						FUEL	COLUMN V					
RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES						RANGE IN AIRMILES						RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES					
STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE			NAUTICAL		
						1360	← MAIN, AUXILIARY, BOMB BAY AUXILIARY, AFT FUSELAGE & DROPPABLE WING TANKS →																		1360	S.L.	10,000		S.L.	10,000	
980		850				1295	1555		1350				1880		1630				2140		1855				1295	2405	2495		2085	2165	
905		785				1200	1440		1250				1740		1510				1980		1720				1200	2220	2305		1930	2000	
830		720				1100	1320		1145				1595		1380				1815		1575				1100	2030	2110		1760	1830	
						1050	← MAIN, AUXILIARY, BOMB BAY AUXILIARY, & AFT FUSELAGE TANKS →																		1050						
755		655				1000	1200		1040				1450		1260				1650		1430				1000	1840	1910		1600	1660	
745		645				985	1180		1025				1430		1240				1625		1410				985	1815	1880		1575	1635	
						925	← MAIN, AUXILIARY, & BOMB BAY AUXILIARY TANKS →																		925						
680		590				900	1080		935				1305		1130				1485		1290				900	1650	1715		1435	1490	
650		565				860	1030		885				1250		1085				1420		1225				860	1575	1635		1370	1420	
605		525				800	960		835				1160		1005				1320		1145				800	1460	1515		1270	1315	
530		460				700	840		730				1015		880				1155		1000				700	1270	1320		1105	1145	
455		395				600	720		625				870		755				990		860				600	1080	1120		940	975	
380		325				500	600		520				725		630				825		715				500	890	925		775	800	
300		260				400	480		415				580		505				660		575				400	715	740		620	640	
225		195				300	360		310				435		380				495		430				300	535	555		465	480	
MAXIMUM CONTINUOUS						PRESS	(1.20 STAT. (1.04 NAUT.) MI./GAL.)						(1.45 STAT. (1.26 NAUT.) MI./GAL.)						(1.65 STAT. (1.43 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	F.T.	A.R.	280	310	265	20000	2300	F.T.	A.R.	250	300	260	2150	F.T.	A.R.	195	285	245	2100	F.T.	A.L.	155	265	230	20000						
2400	42	A.R.	410	320	280	15000	2200	33.5	A.R.	235	285	245	2200	F.T.	A.R.	185	275	240	2050	30.5	A.L.	150	250	220	15000	1850	F.T.	A.L.	115	220	190
2400	42	A.R.	390	300	260	10000	2200	33	A.R.	230	280	240	2100	33	A.L.	185	270	235	2000	30	A.L.	150	250	220	10000	1850	26.5	A.L.	115	215	185
2400	42	A.R.	380	295	255	5000	2150	34	A.R.	215	260	225	2100	33	A.L.	170	250	220	1950	31	A.L.	140	230	200	5000	1850	28.5	A.L.	115	210	180
2400	42	A.R.	360	280	240	S.L.	2150	35	A.R.	205	245	215	2100	33	A.L.	155	230	200	1900	31.5	A.L.	125	215	185	S.L.	1800	29	A.L.	105	190	165

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 55) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.
(3) ALTERNATE MAXIMUM FUEL CAPACITIES.

EXAMPLE

AT 32,000 LB. GROSS WEIGHT WITH 500 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 85 GAL.) TO FLY 825 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 1950 RPM AND 31 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN, LOW BLOWER

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 5 JUNE 1945 BASED ON: FLIGHT TEST & FULL SCALE TUNNEL DATA

Figure 58 (Sheet 3 of 4)—Flight Operation Instruction Chart

AAFMC-528 6-1-46 WF-13-1146-10M

AIRCRAFT MODEL(S)
A-26B & A-26C
COMBAT & FERRY CONFIGURATION
ENGINE(S): P. & W. R-2800-27, -71, & -79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 29,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION
NUMBER OF ENGINES OPERATING: 2

LIMITS	RPM.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	F.T.	LOW	A.R.	5 MIN	260°C	520
	2700	F.T.	HIGH	A.R.	5 MIN	260°C	496
MILITARY POWER	2700	52	LOW	A.R.	5 MIN	260°C	580
	2700	47	HIGH	A.R.	5 MIN	260°C	540

FOR DETAILS SEE POWER PLANT CHART (FIG. 25 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[2] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V 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 REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[1]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I						FUEL	COLUMN II						COLUMN III						COLUMN IV						FUEL	COLUMN V					
RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES						RANGE IN AIRMILES						RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES					
STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
							SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																			S.L.	10,000	S.L.	10,000		
605	530	525	460			800	960	840	835	730			1160	1015	1005	880			1320	1155	1145	1000			800	1520	1580	1320	1370		
						700																			700	1330	1380	1155	1200		
455	380	395	325			600	720	600	625	520			870	725	755	630			990	825	860	715			600	1140	1185	990	1030		
						500																			500	950	990	835	860		
300	225	260	195			400	480	360	415	310			580	435	505	380			660	495	575	430			400	760	790	660	685		
	150		130			300		240		210				290		250				330		285			300	570	595	495	515		
	75		65			200		120		105				145		125				165		145			200	380	395	330	345		
						100																			100	190	200	165	170		

MAXIMUM CONTINUOUS						PRESS	(1.20 STAT. (1.04 NAUT.) MI./GAL.)						(1.45 STAT. (1.26 NAUT.) MI./GAL.)						(1.65 STAT. (1.43 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES Hg	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	F.T.	A.R.	280	310	265	20000	2300	F.T.	A.R.	250	305	265	2150	F.T.	A.R.	195	290	250	2100	F.T.	A.L.	155	275	240	20000						
2400	42	A.R.	410	325	280	15000	2200	34	A.R.	240	290	250	2200	F.T.	A.R.	185	280	240	2050	31.5	A.L.	160	265	230	15000	1800	24	A.L.	105	215	185
2400	42	A.R.	390	300	260	10000	2200	33	A.R.	230	280	240	2100	33	A.L.	185	270	235	2050	30.5	A.L.	155	255	220	10000	1800	25.5	A.L.	105	210	180
2400	42	A.R.	380	300	260	5000	2150	34	A.R.	215	265	230	2100	33	A.L.	170	250	220	1950	31	A.L.	140	235	205	5000	1700	25.5	A.L.	95	185	160
2400	42	A.R.	360	280	240	S.L.	2150	35	A.R.	205	250	220	2100	33	A.L.	155	230	200	1950	32	A.L.	135	220	190	S.L.	1700	28	A.L.	95	180	155

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 55) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 29,000 LB. GROSS WEIGHT WITH 400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 100 GAL.) TO FLY 660 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 2050 RPM AND 30.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN, LOW BLOWER.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 5 JUNE 1945 BASED ON: FLIGHT TEST & FULL SCALE TUNNEL DATA

Figure 58 (Sheet 4 of 4)—Flight Operation Instruction Chart