T. O. No. 1B-26B-1
(FORMERLY AN 01-40AJ-1)

HANDBOOK
FLIGHT OPERATING INSTRUCTIONS

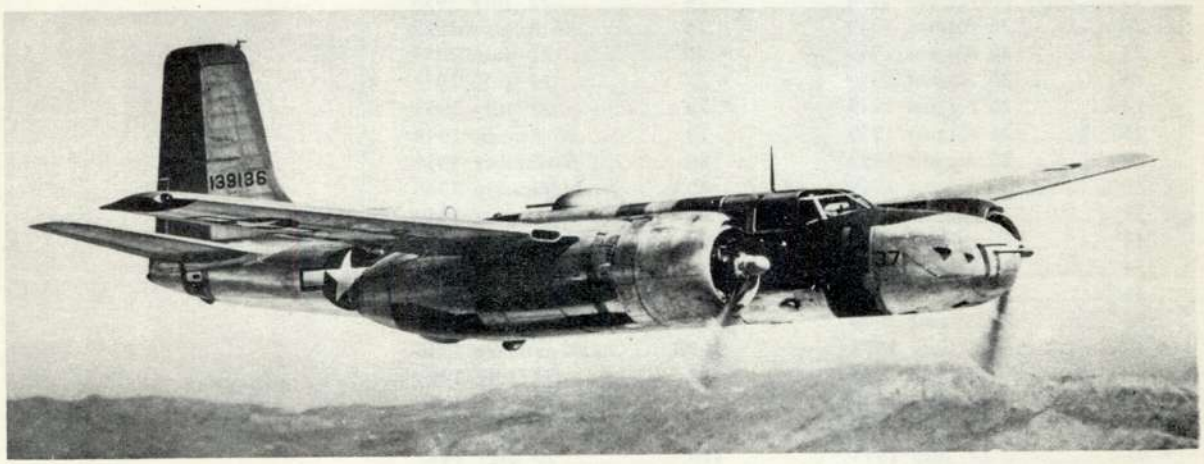
USAF SERIES

B-26B
B-26C

NAVY MODEL

JD-1

AIRCRAFT



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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE
AND THE CHIEF OF THE BUREAU OF AERONAUTICS

★

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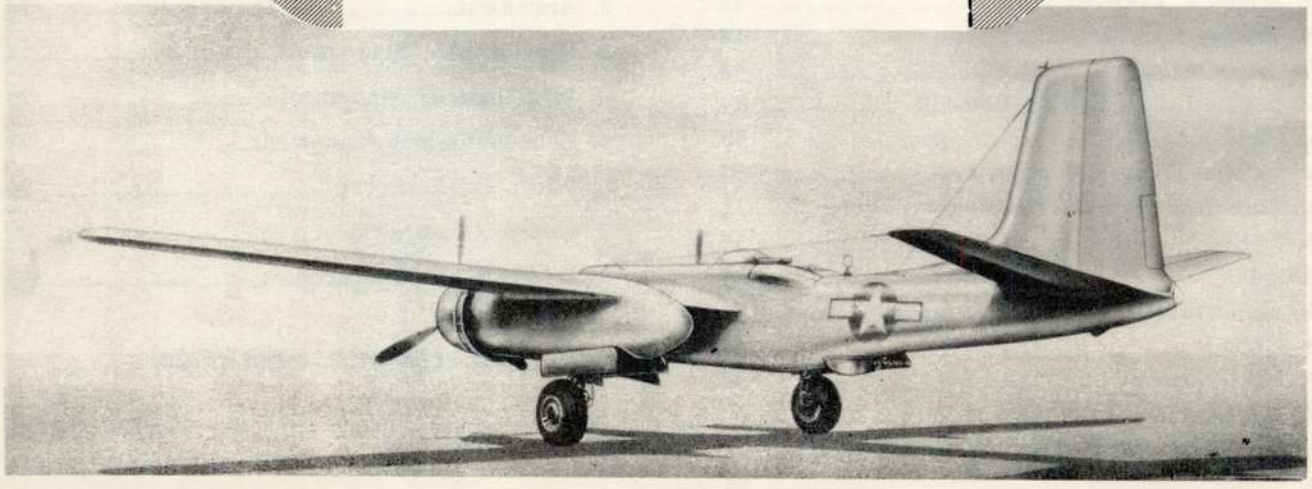


IMPORTANT

In order to gain the maximum benefits from this handbook, it is imperative that you read the introduction carefully.

This handbook contains all information necessary for safe and efficient operation of the B-26 series airplanes. These instructions do not teach basic flight principles, but are designed to provide you with a general knowledge of the airplane, its flight characteristics, and specific normal and emergency procedures to be used in operating the airplane and its related equipment. Your flying experience is recognized, and elementary instructions have been avoided.

Every effort has been made to make this book easy to read and assimilate. Read and study the complete handbook to gain an over-all knowledge of the airplane; then use the book as a reference manual to answer specific questions. The Flight Handbook will be continuously revised to reflect each change that is made on the airplane. The contents of the Flight Handbook are based on the best technical knowledge of the aircraft manufacturer and the Air Force as well as the experience of the using commands.

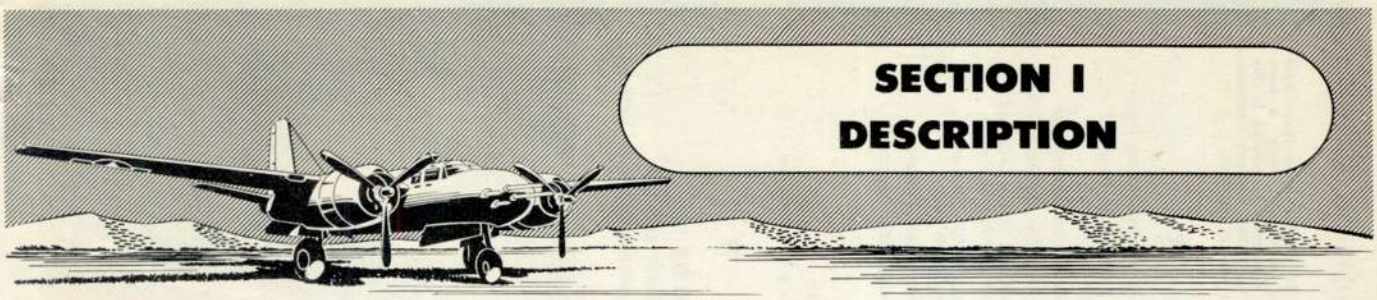
Another important point to keep in mind is that each flight crew member is to have his own personal copy of the Flight Handbook. It is essential that each base make their quantity requirements known as soon as the applicable technical order is listed in the Publications Requirements Table (T.O. 00-3-1) because it is through these quantity statements that the Air Force decides on how many handbooks of a given kind will be printed. Of course, each base must develop a system of feeding revision material to each holder of a handbook so that no one will be using an obsolete book. Should any question arise as to how to secure the necessary copies of the books and their subsequent revision check with T.O. 00-5-2. That technical order gives you the whole story in just a few pages. Your base inspector is charged with the responsibility of ordering and securing quantities of the handbooks in accordance with your requirements—check with him.

One more thing—it takes a certain amount of time to revise the Flight Handbook and get the new data to the flight crews. To overcome these delays when safety of flight information is involved, the immediate attention technical order system is employed. Therefore to make sure that you have the very latest information available on the B-26 aircraft, for example, you must be on automatic distribution for the following series of technical orders:

01-40AJ—Covers all B-26 models
01-40AJA—Covers B-26 Series B,C,D,E,
RB-26 Series C

All of the technical orders with these prefix numbers will not cover information affecting the flight crews. Therefore someone will have to be assigned the task of screening these technical orders to select operating instructions information for distribution to the flight personnel.

The Air Force has provided you with the machinery for remaining abreast of your aircraft — it is up to you to take the few simple steps that will close the circuit and get the machinery to accomplish useful work.



SECTION I
DESCRIPTION

Note

The model designations A-26B and A-26C have been changed to B-26B and B-26C.

1. GENERAL.

a. MODEL AND TYPE. — The B-26B attack bomber airplane is a twin-engined, mid-wing land monoplane with a tricycle type landing gear. The B-26C airplane is identical to the B-26B airplane with the exception that a bombardier's compartment nose section replaces the attack nose of the B-26B airplane. All reference to a bombardier or bombardier's compartment throughout this handbook pertains to the B-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	Identical except for
or	ignition harnesses.
R-2800-71	
or	Water injection provisions
R-2800-79	of War Emergency power.

c. OVERALL DIMENSIONS.

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

d. CREW MEMBERS.—The crew of the B-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 B-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 or passengers should not occupy the nose compartment during take-off or landing. Crew members can move through the bomb bay while the airplane is in flight, provided a long range fuel tank, a smoke tank, 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 left-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 deatachable 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.

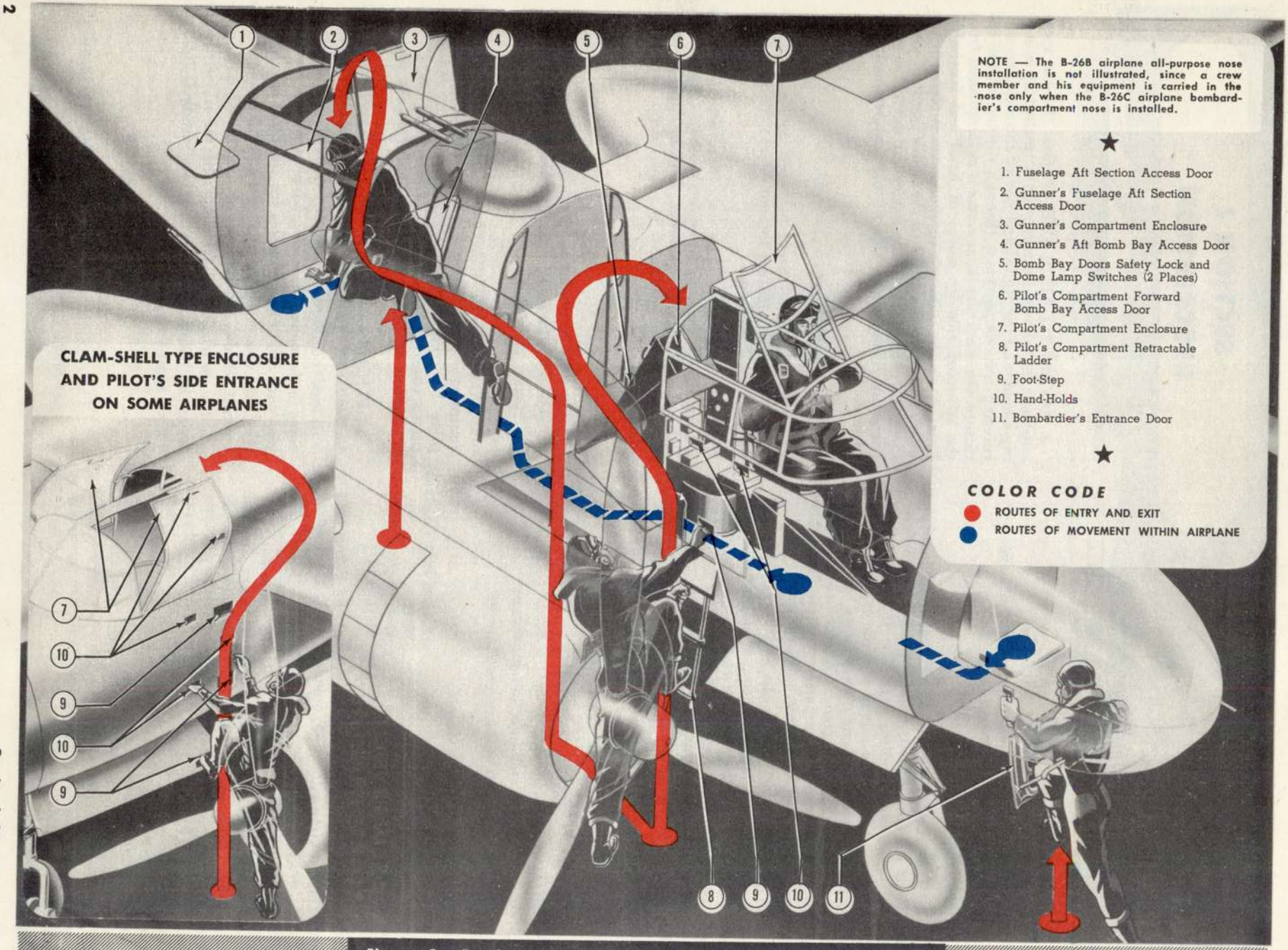
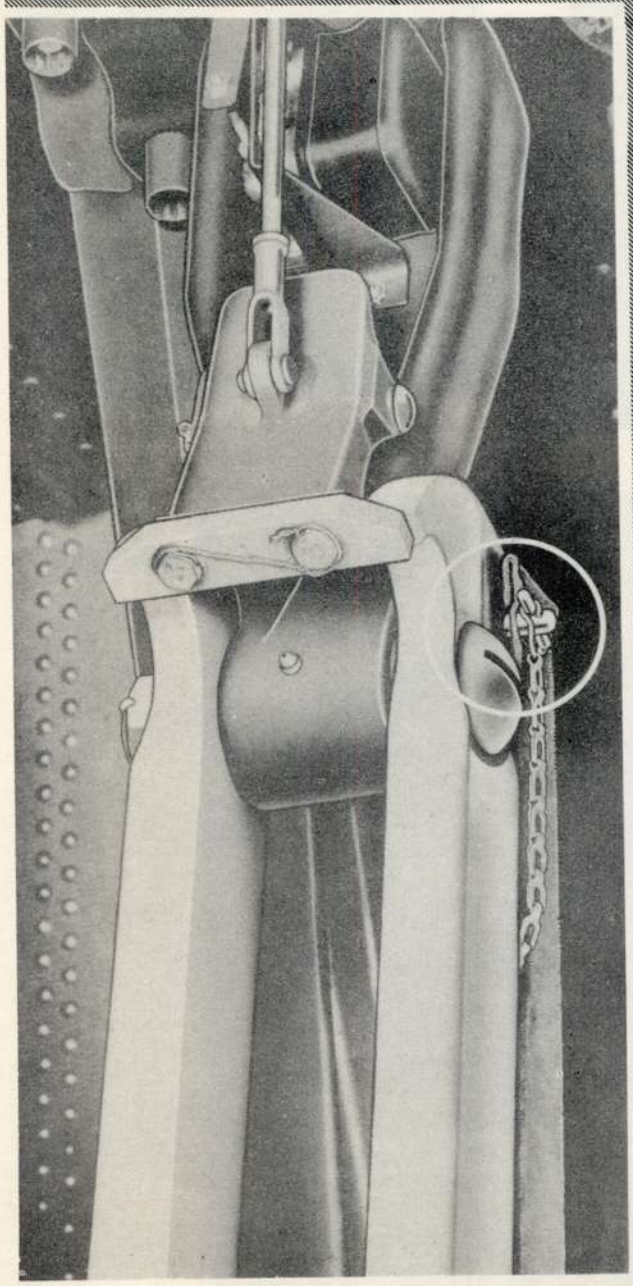
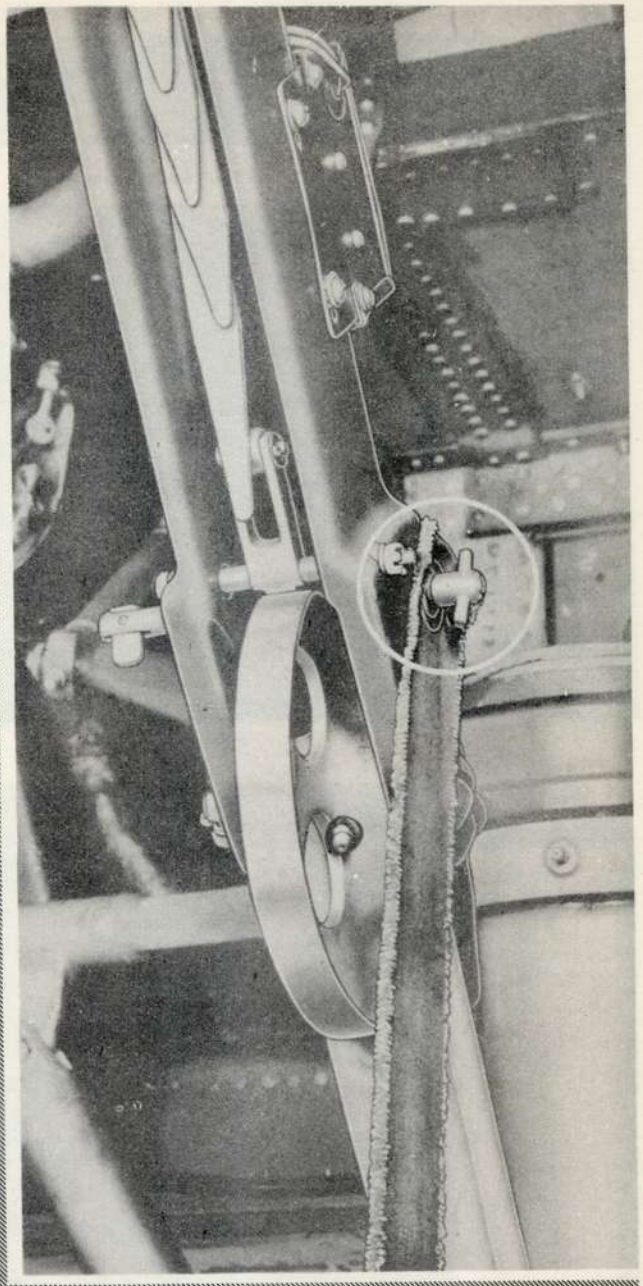


Figure 2 —Fuselage Compartments—Crew Entry and Exits Diagram

MAIN GEAR SAFETY PIN AND BLOCK





NOSE GEAR SAFETY PIN AND BLOCK

Figure 3 —Landing Gear Safety Pins and Blocks Installed

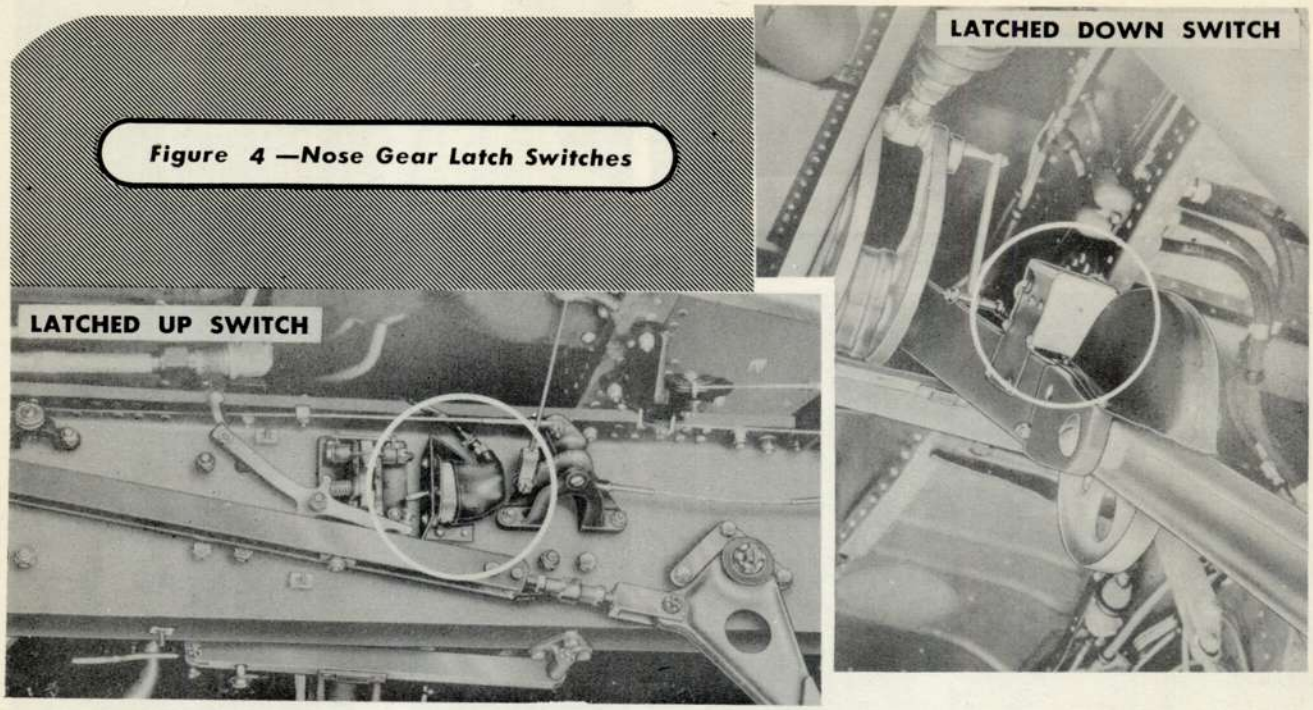


Figure 4 —Nose Gear Latch Switches

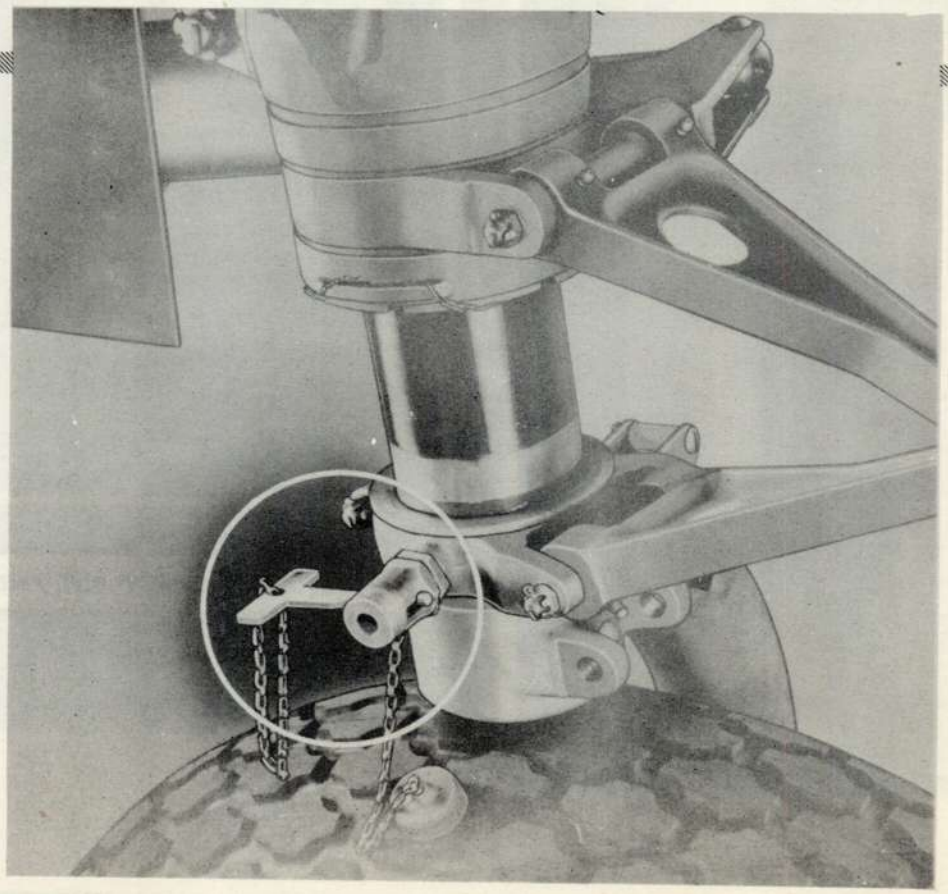


Figure 5 —Nose Wheel Snubbing Pin (Disengaged)

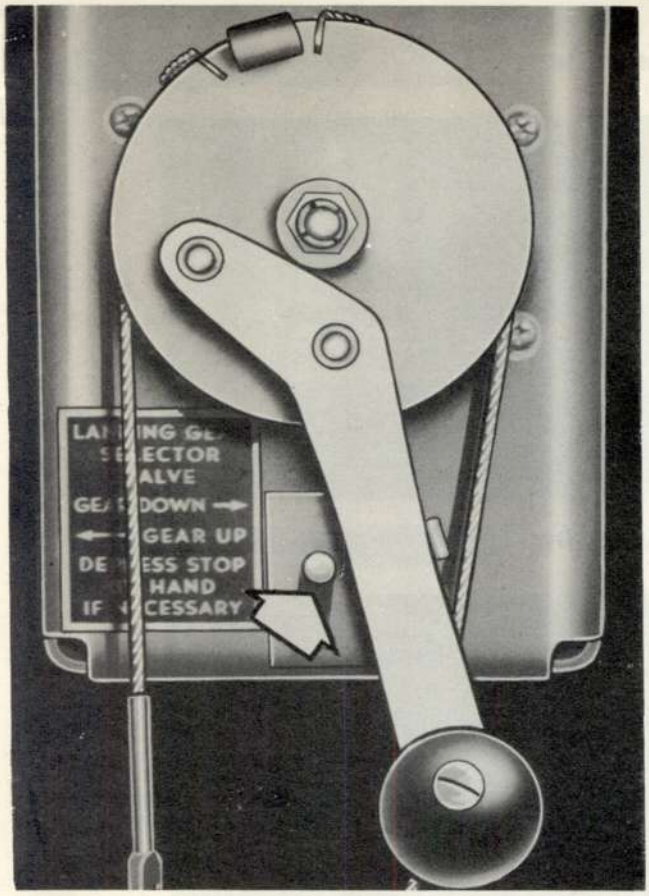


Figure 6—Landing Gear Auxiliary Control and Solenoid Locking Pin

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 acts synchronously with the landing gear lever on the control pedestal and can be used to operate the landing gear in event of malfunction of the lever control system on the pedestal. An emergency main landing gear uplatch release is located behind and to the right of the pilot's seat and over the interphone jack box. This control can be used to release manually the main landing gear uplatches in the event of malfunction of these uplatches. 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, the red warning lamp will light, indicating an unsafe condition for landing; when the throttles are fully retarded a warning horn will sound. 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 latched down. 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. Some airplanes are equipped with an inspection light to provide a visual means of checking the position of the nose wheel during night landings. The switch for the nose wheel inspection light is located on the pilot's overhead electrical control panel *(figure 10)*.

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.

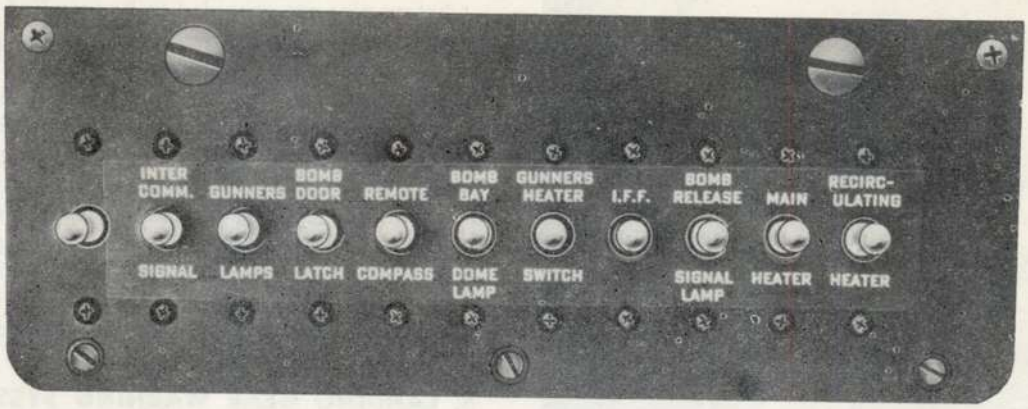
Note

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

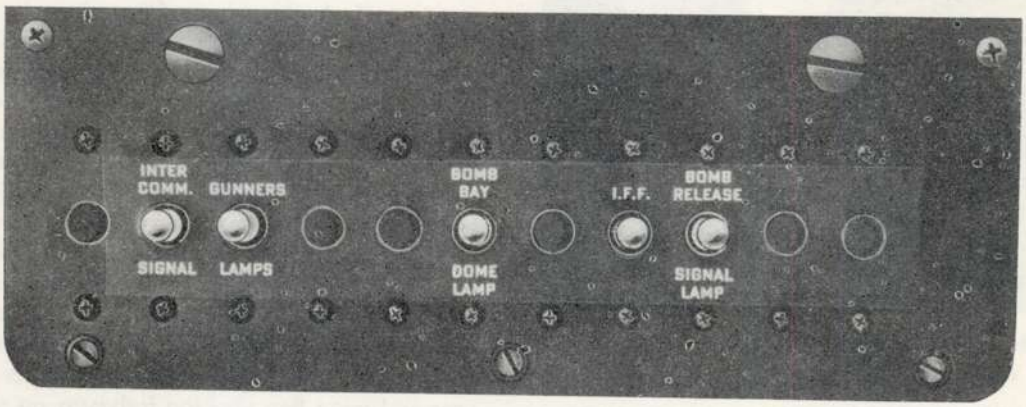


Figure 7 Fuselage Aft (Gunner's) Relay Box

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 34, sheet 2.*

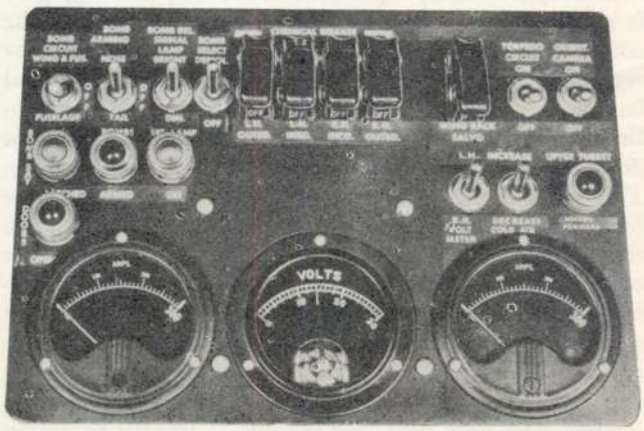


Figure 8—Pilot's Auxiliary Electrical Control Panel (Early Airplanes)

An ac power supply system is installed on some modified B-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.

An ac power supply system is installed on some modified B-26C airplanes. The equipment consists of two inverters, a lamp, a dc voltmeter, an ac voltmeter and a junction box, all located in the radio 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 rocker 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.

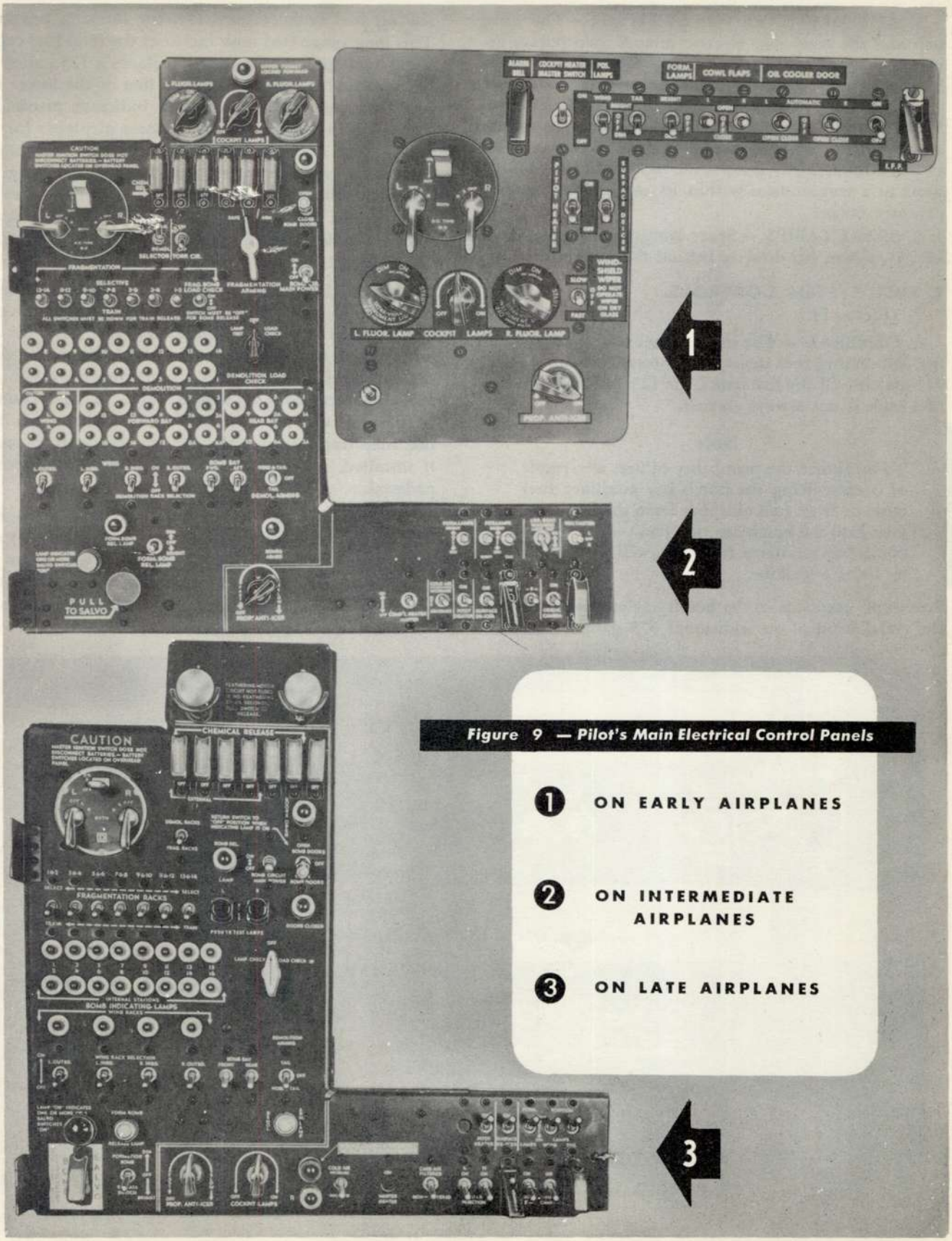


Figure 9 — Pilot's Main Electrical Control Panels

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. Of the five tanks, the 125 gallon bomb bay fuel tank is not always carried.

Note

To minimize the possibility of fires as a result of overservicing the bomb bay auxiliary fuel tank, or from fuel escaping from the fuel tank vent into the bomb bay, the fuel service of the bomb bay auxiliary fuel tank will be limited to 100 US gallons.

Provisions are made in the bomb bay compartment for the installation of an additional 675 gallon, non-self-sealing fuel tank *(Figure 15)*, for ferrying purposes. This long range fuel tank increases the total fuel capacity to 1600 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 gages are provided for the wing drop tanks. The fuel for this airplane is in accordance with Specification MIL-F-5572, Grade 100/130.

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.*

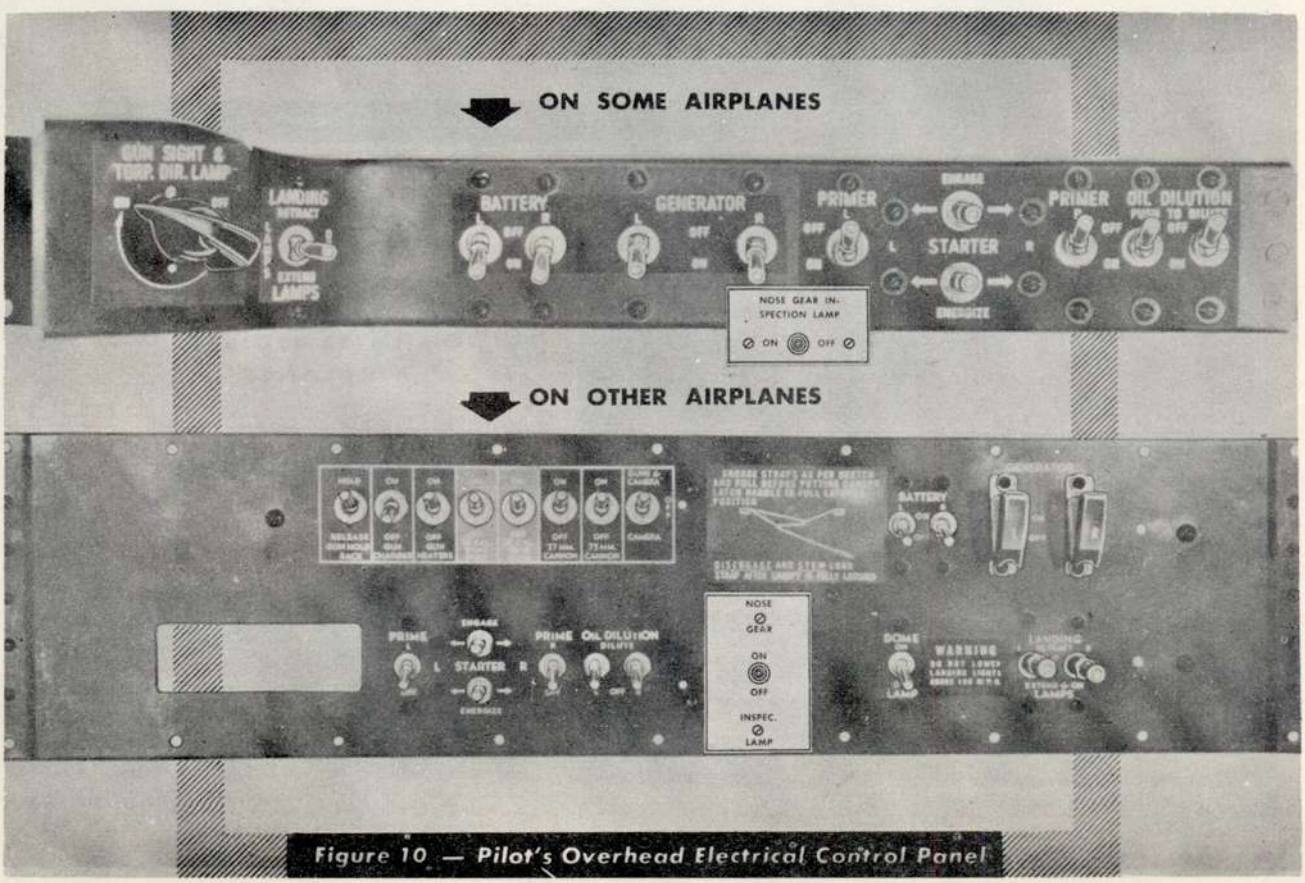
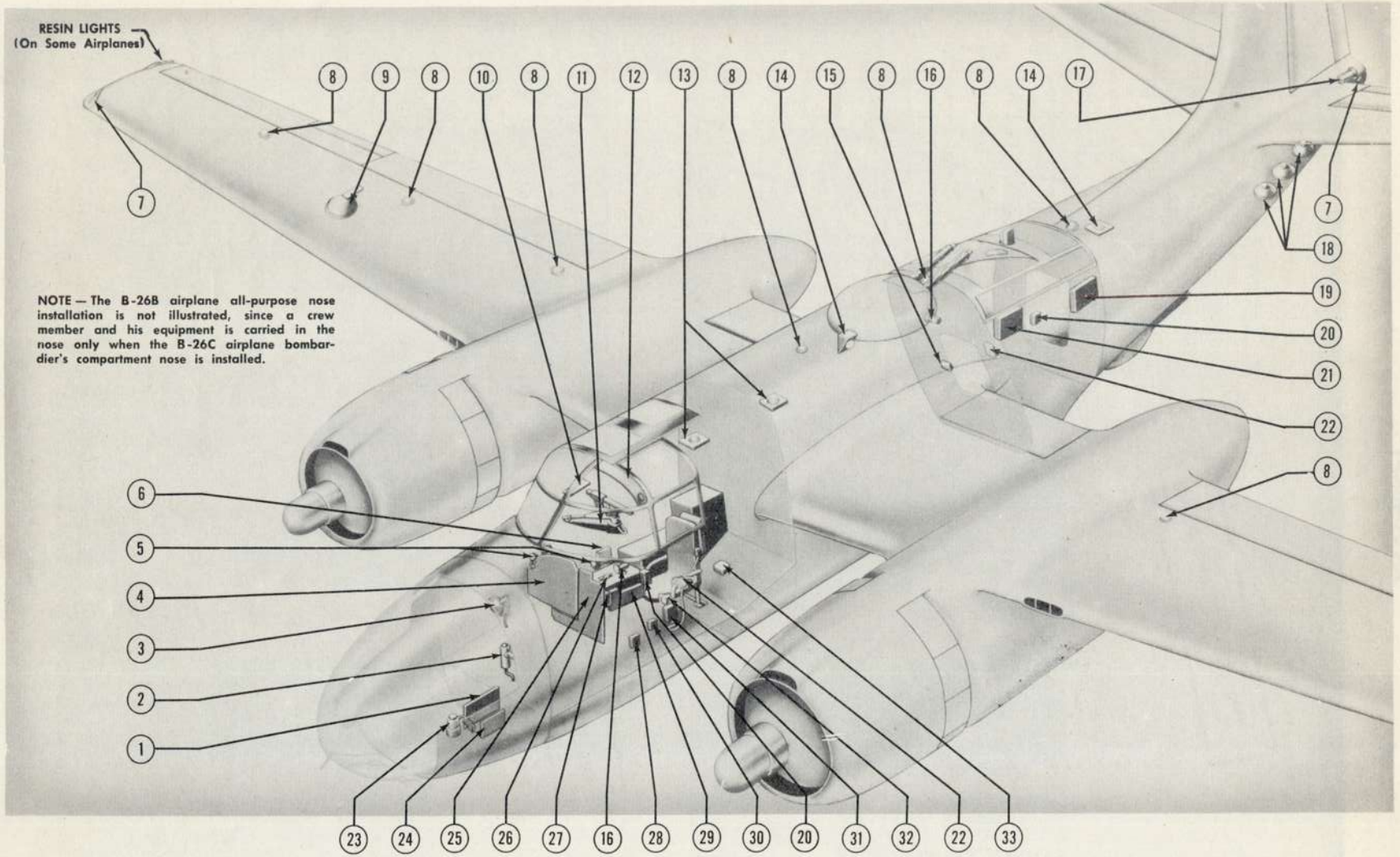


Figure 10 — Pilot's Overhead Electrical Control Panel



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

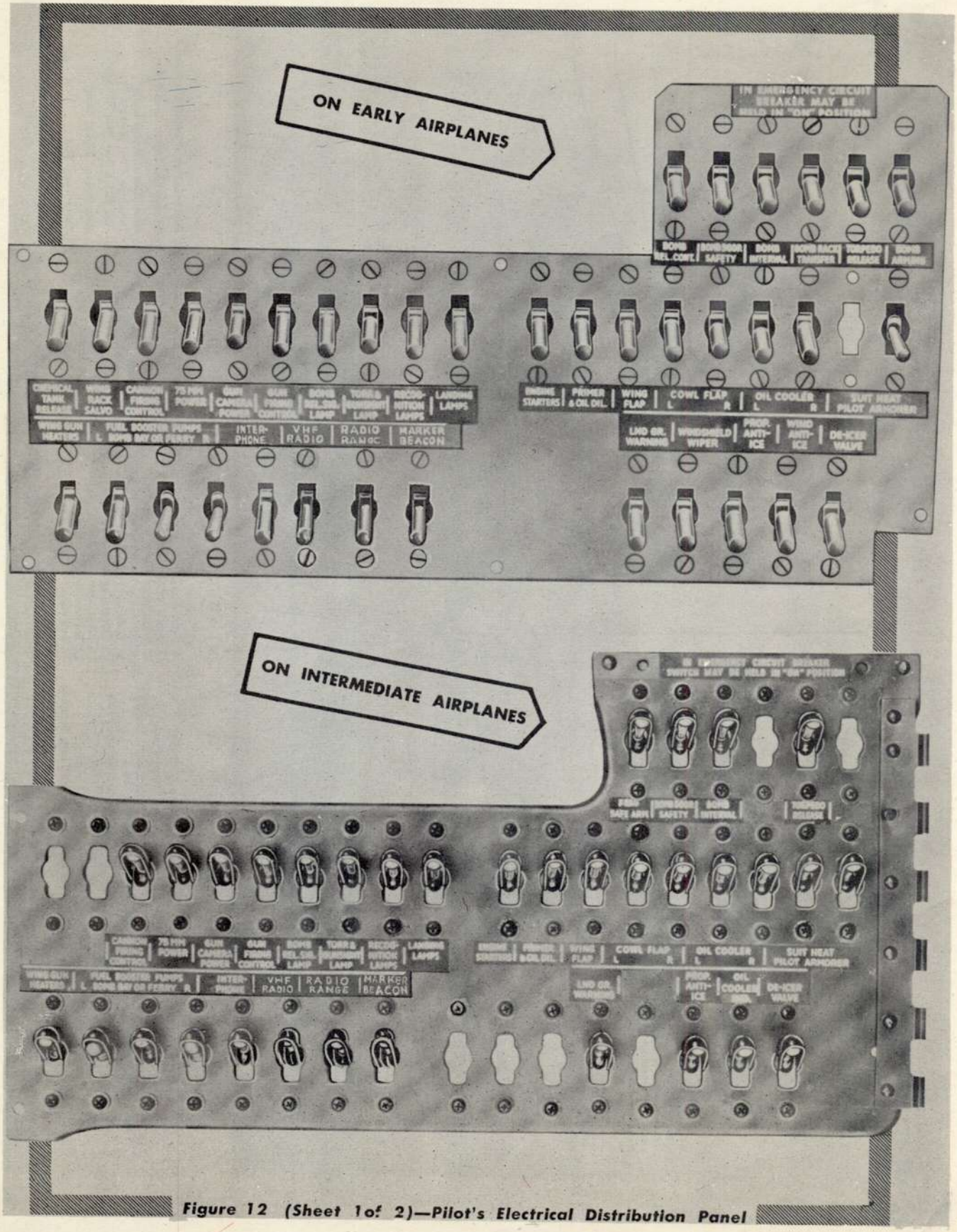


Figure 12 (Sheet 1 of 2)—Pilot's Electrical Distribution Panel

Note

When operating the booster pumps in the high boost condition, the pressure is dependent upon the setting of 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.

OIL SPECIFICATION "MIL-0-6082, Grade 1100."

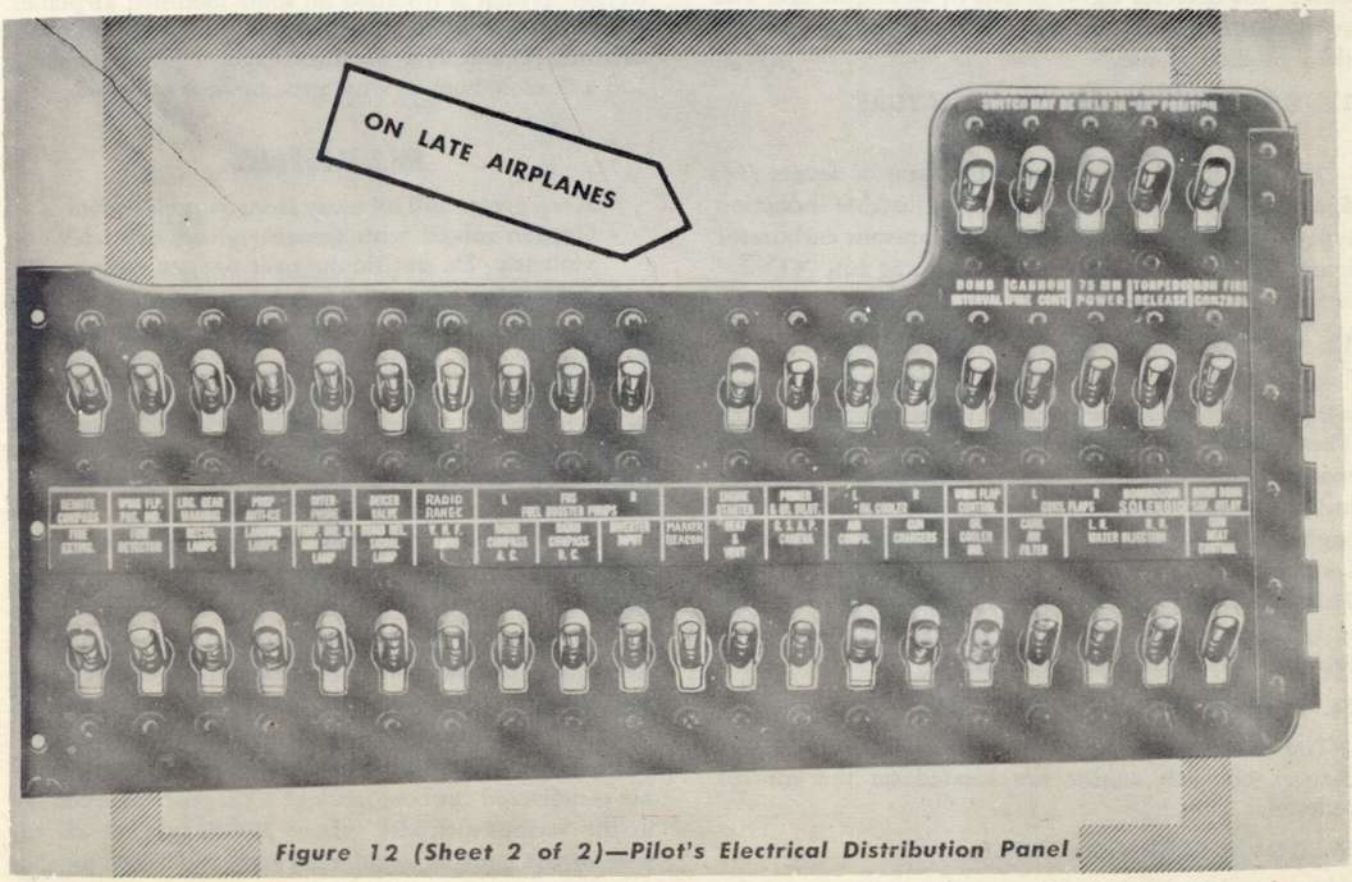


Figure 12 (Sheet 2 of 2)—Pilot's Electrical Distribution Panel.

11. ENGINE CONTROLS.

(Figure 17.)

The engine controls are mounted on the control pedestal and are conventional in operation. The Stromberg carburetor installation has three mixture control positions: "IDLE CUT-OFF," "AUTO-LEAN," and "AUTO-RICH." A mixture control latch is provided to lock the control in postion to prevent inadvertent movement of the control to "IDLE CUT-OFF."

a. ENGINE FIRE EXTINGUISHER SYSTEM CONTROLS. *(Figure 18.)*

The engine fire extinguisher system contains three high pressure CO_2 cylinders located in the left engine nacelle. The cylinders may be discharged in the accessory section of either engine. The system controls consist of two engine and hydraulic oil switches, two guarded switches, a system circuit check switch, and two red fire detector lights, *(Figure 9)*. The engine and hydraulic oil switches actuate valves that shut off engine and hydraulic oil at the firewall when placed in the "CLOSE" position. The guarded switches discharge the three cylinders into the accessory section of either engine when these switches are released. The system circuit check switch completes the circuit to the fusible alloy fire detectors on each of the firewalls and causes the red fire detector lights to glow. This insures operation of the detector lights in case of an engine fire. The switches are clearly marked "L" and "R" to indicate their method of use.

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 icing. 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 (switches on some airplanes) 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.

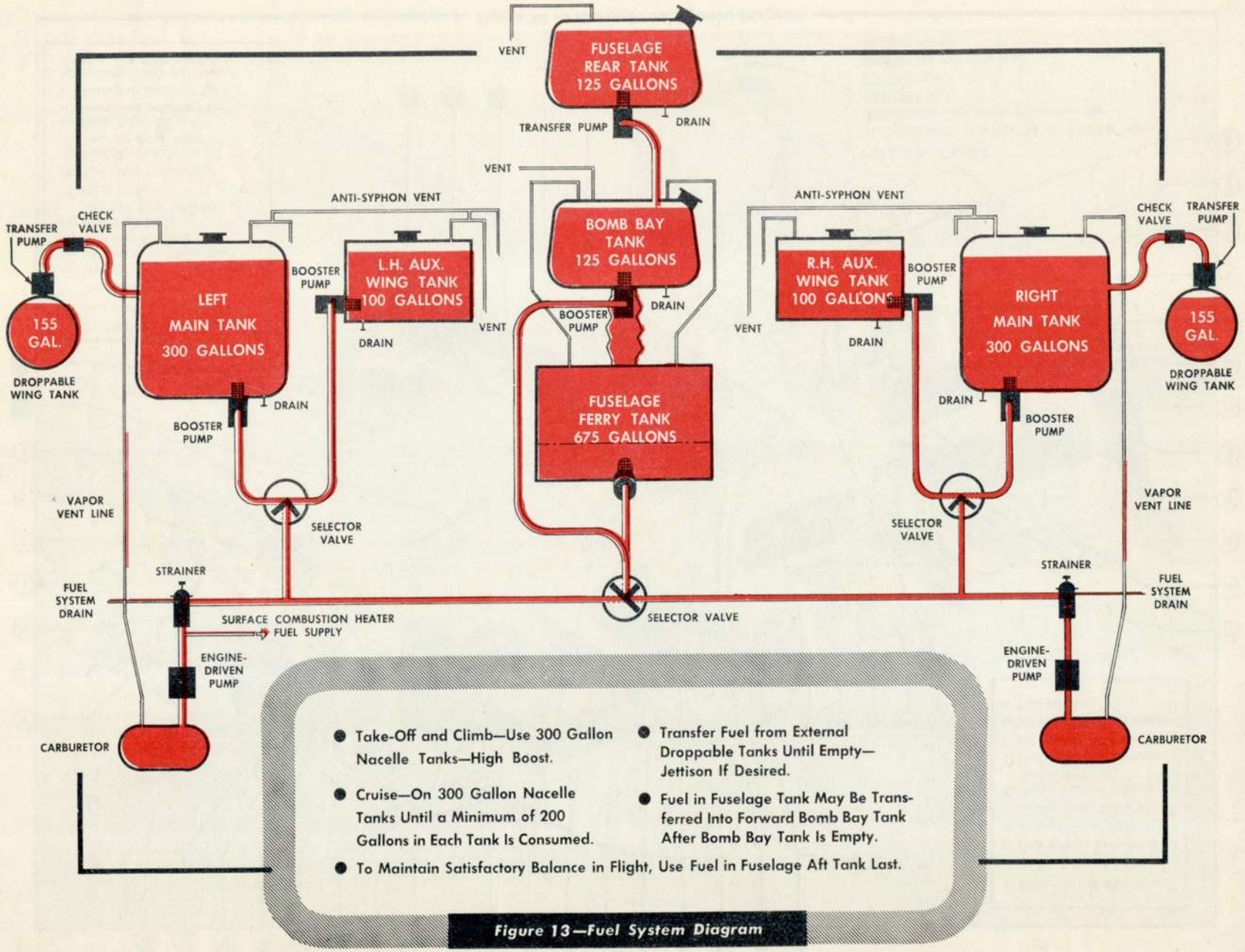
WARNING

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.



- Take-Off and Climb—Use 300 Gallon Nacelle Tanks—High Boost.
- Cruise—On 300 Gallon Nacelle Tanks Until a Minimum of 200 Gallons in Each Tank Is Consumed.
- Transfer Fuel from External Droppable Tanks Until Empty—Jettison If Desired.
- Fuel in Fuselage Tank May Be Transferred Into Forward Bomb Bay Tank After Bomb Bay Tank Is Empty.
- To Maintain Satisfactory Balance in Flight, Use Fuel in Fuselage Aft Tank Last.

Figure 13—Fuel System Diagram

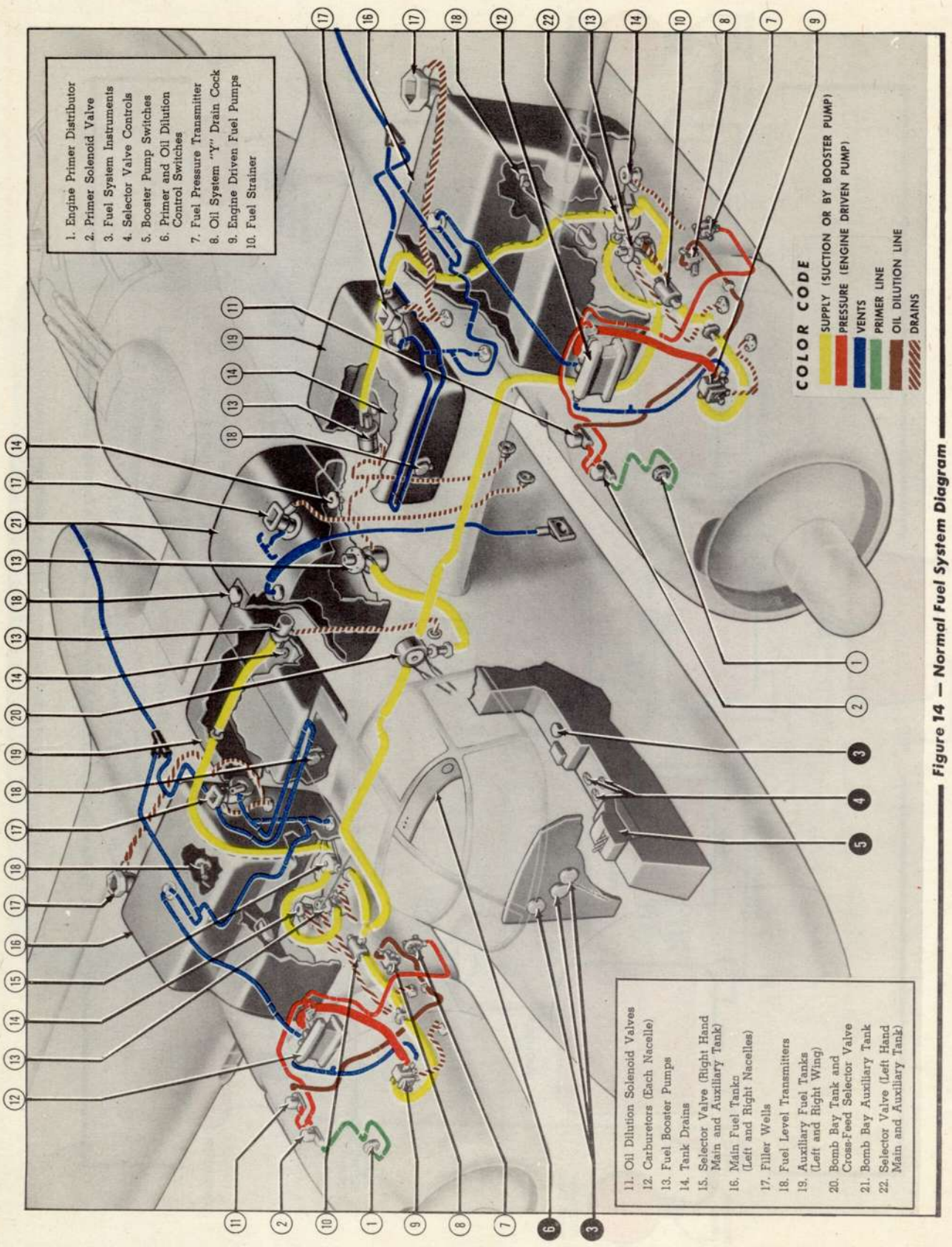


Figure 14 — Normal Fuel System Diagram

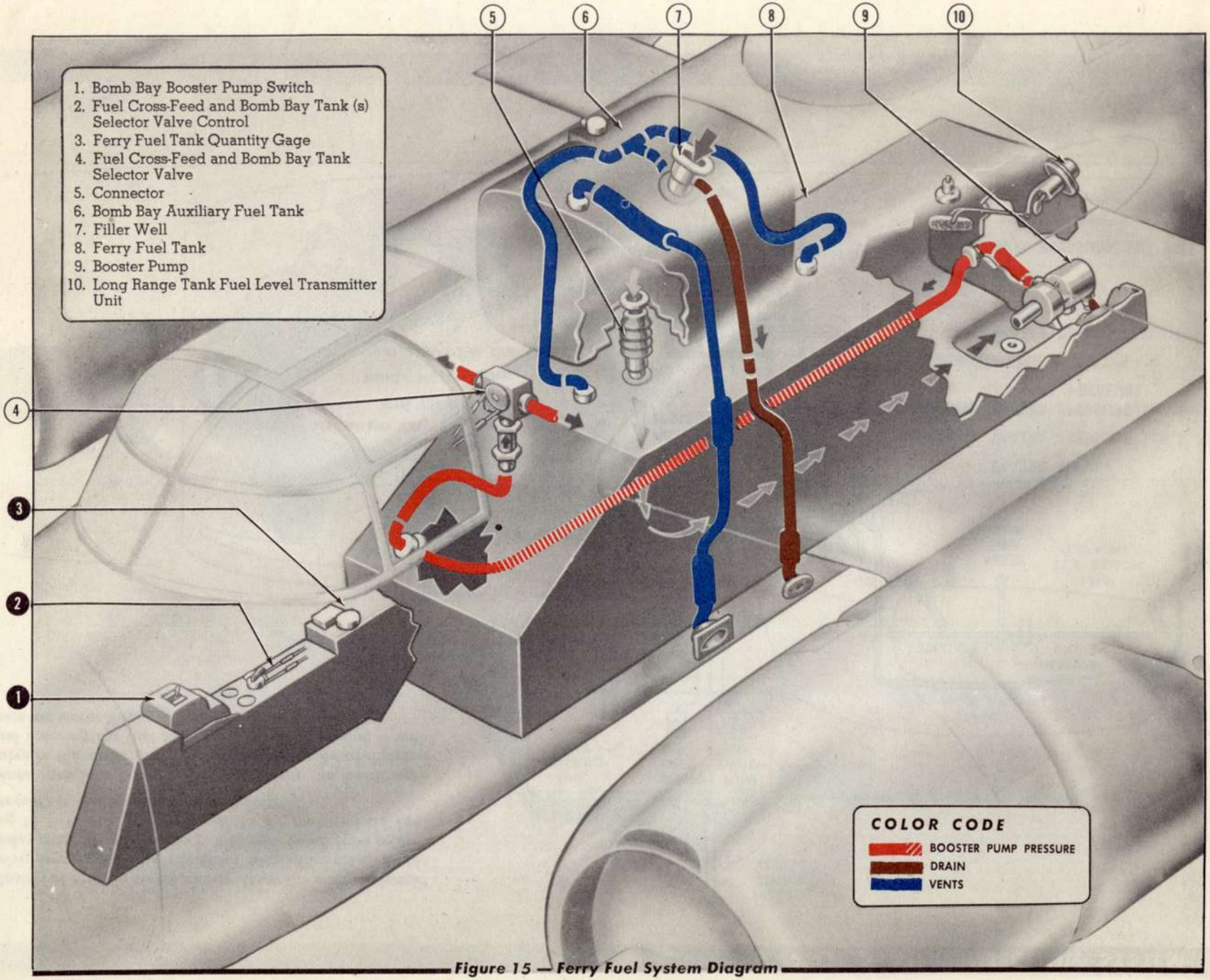


Figure 15 — Ferry Fuel System Diagram

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.

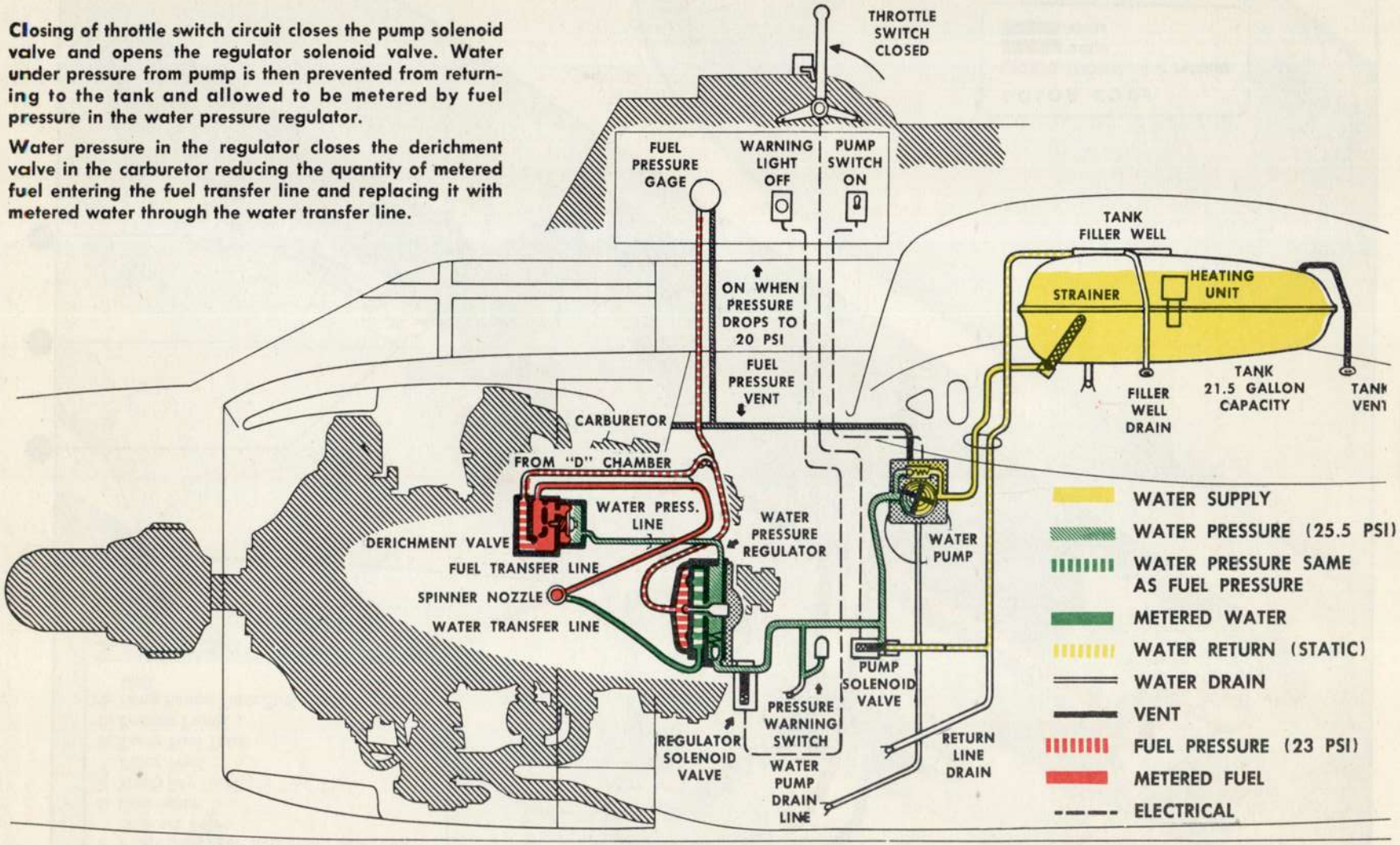
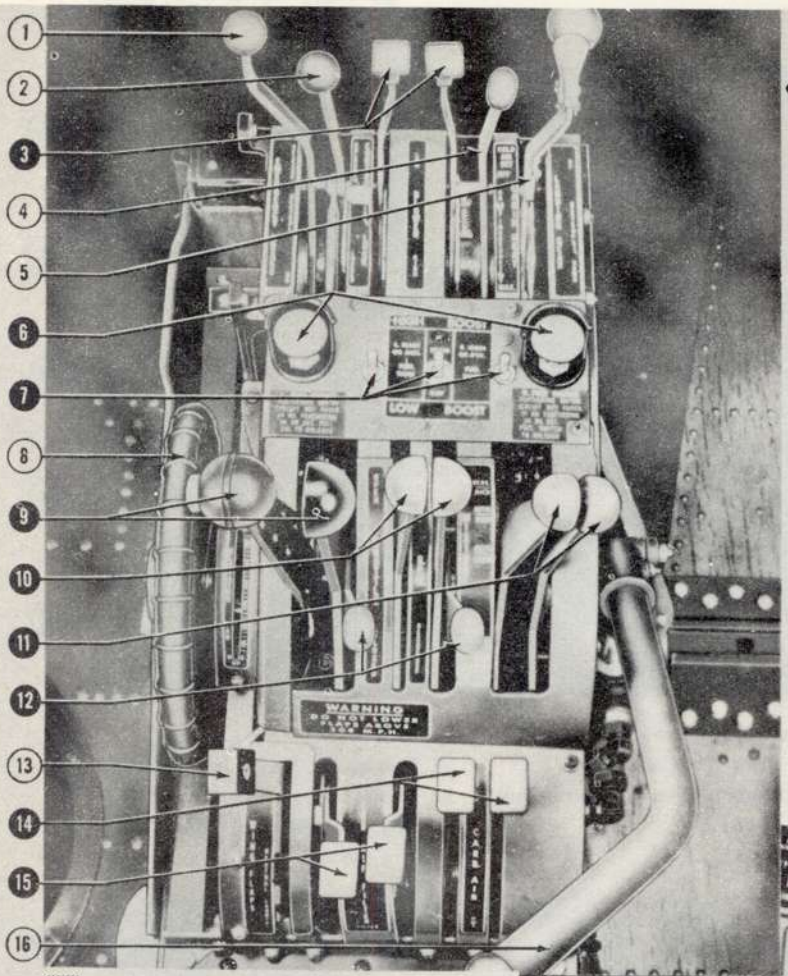
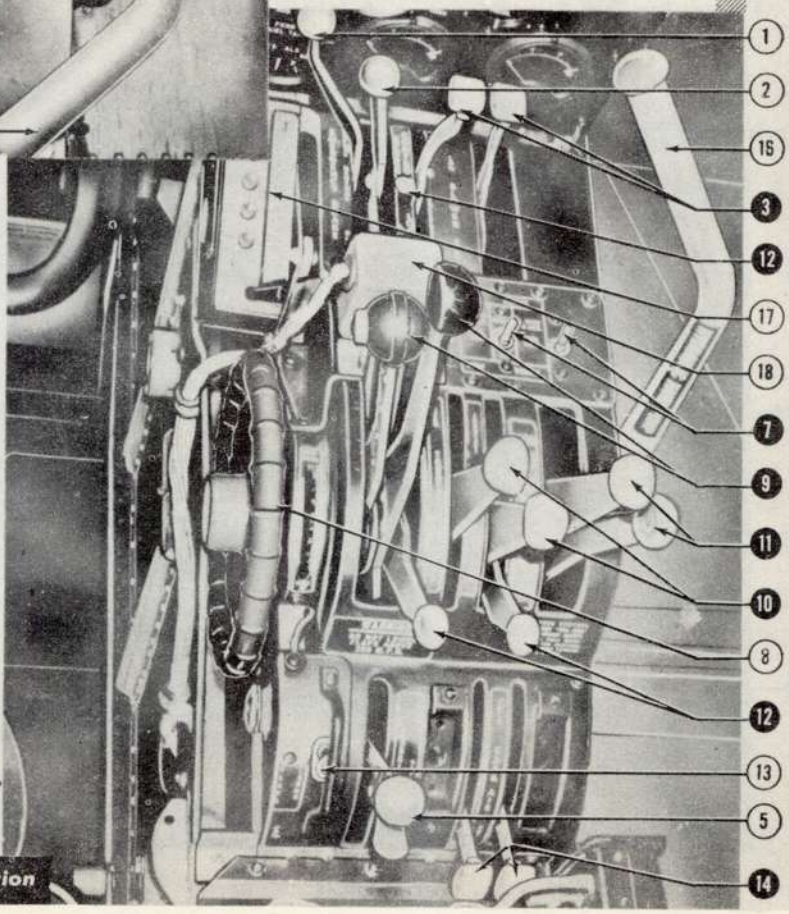


Figure 16 —Water Injection System



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

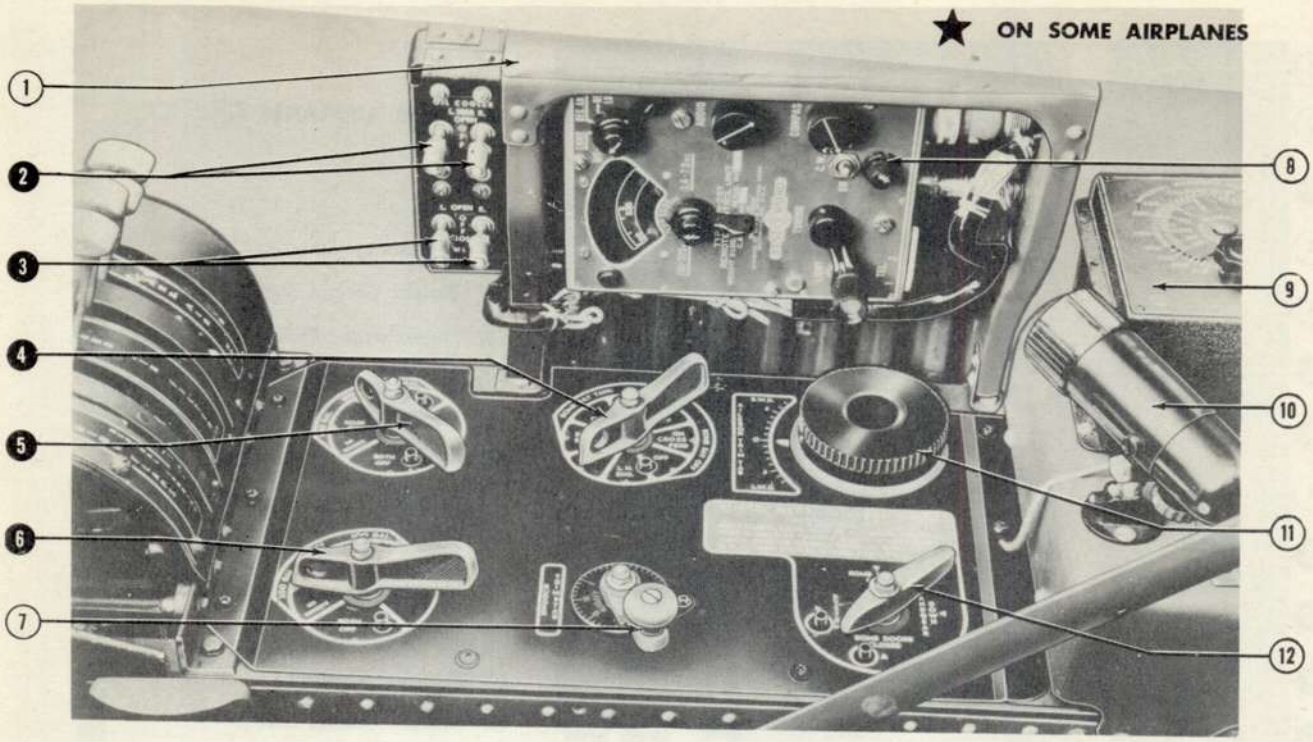


13. Wing Flap Control
14. Carburetor Air Temperature Controls
15. Carburetor Air Filter Controls
16. Hydraulic Hand Pump
17. SCR-522 Radio Control Box
18. Throttle Switch (Water Injection)

ON OTHER AIRPLANES

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some 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

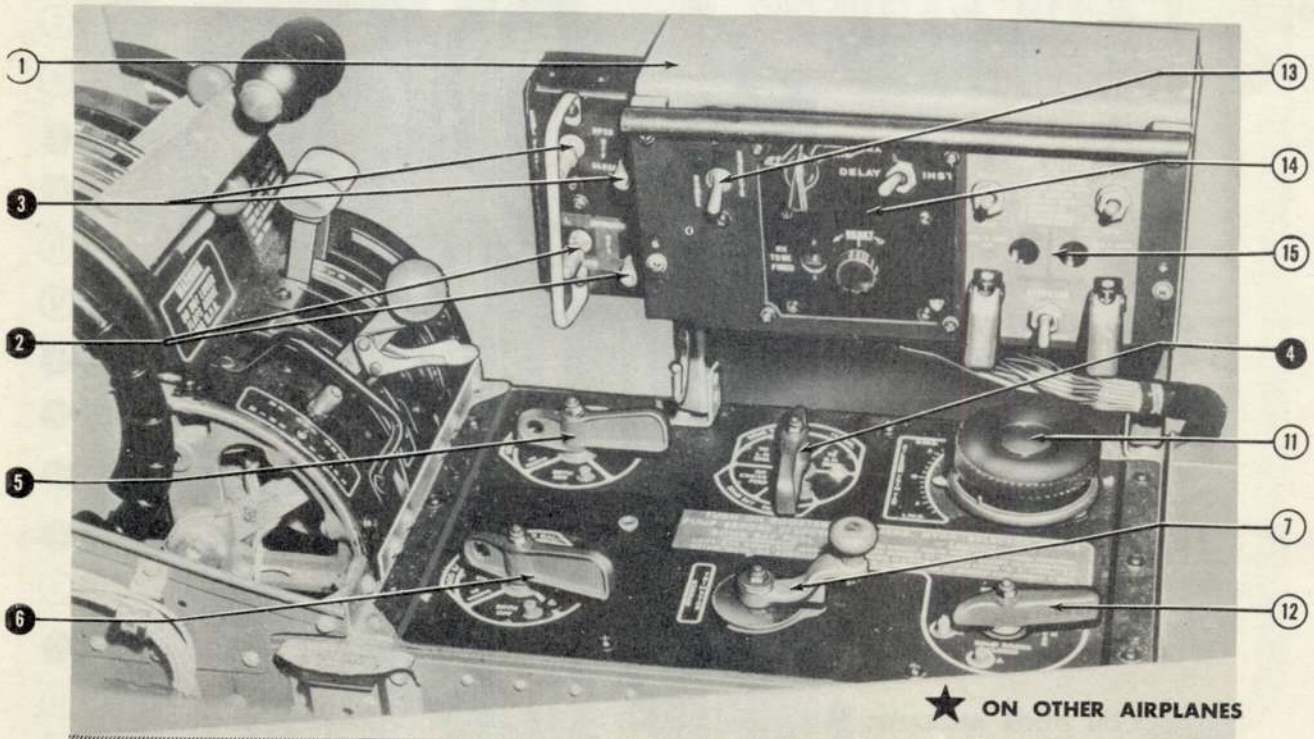
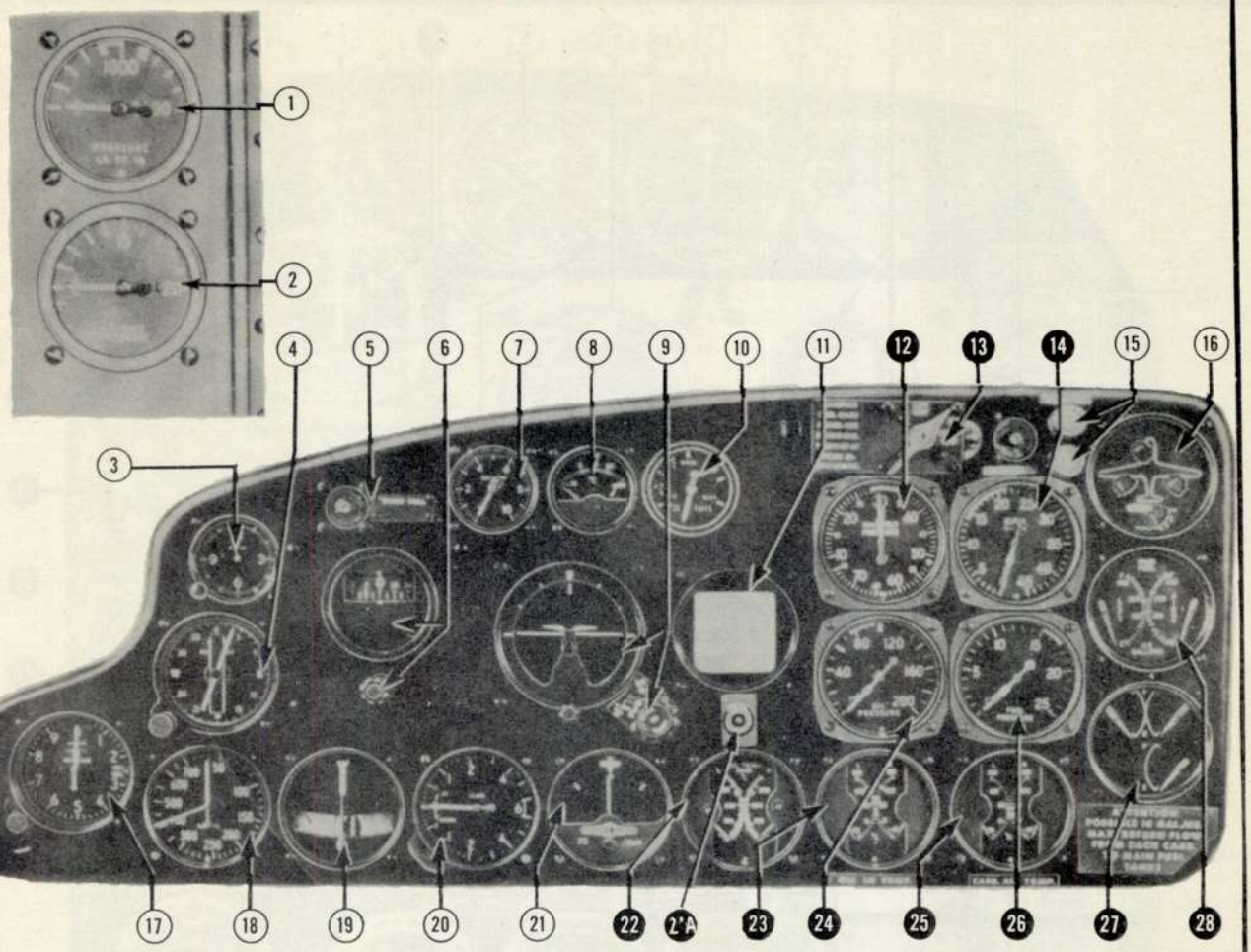


Figure 18—Control Pedestal—Center Section



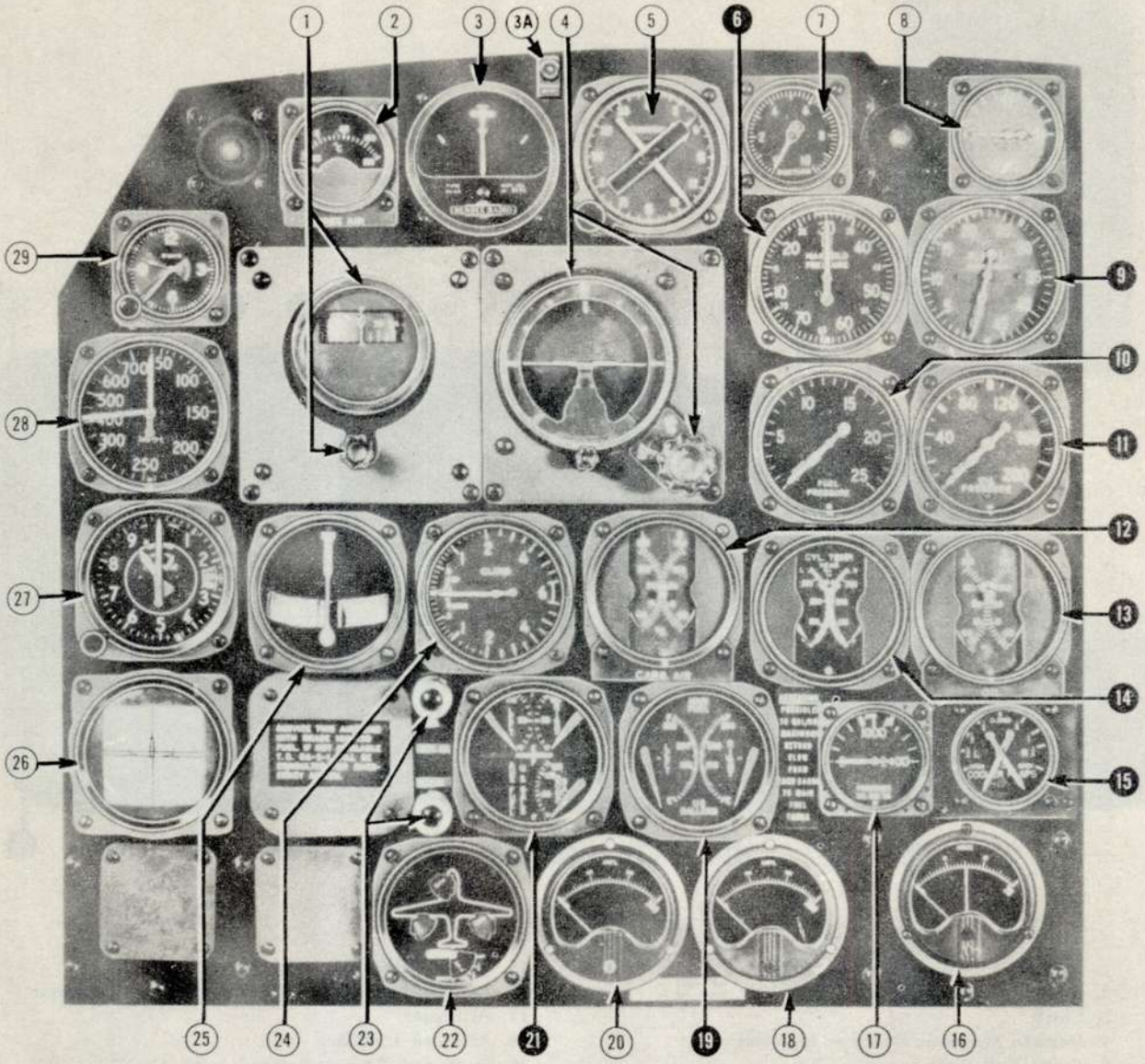
1. Hydraulic System Pressure Gage
2. De-Icer System Pressure Gage
3. Clock
4. Remote Magnetic Compass Indicator
5. Radio Call Plate
6. Directional Gyro Indicator
7. Suction Gage
8. Outside (Free) Air Temperature Indicator
9. Gyro Horizon Indicator and Caging Knob
10. Oil Cooler Door Position Indicator
11. Teel-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

21A.—Marker Beacon 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)

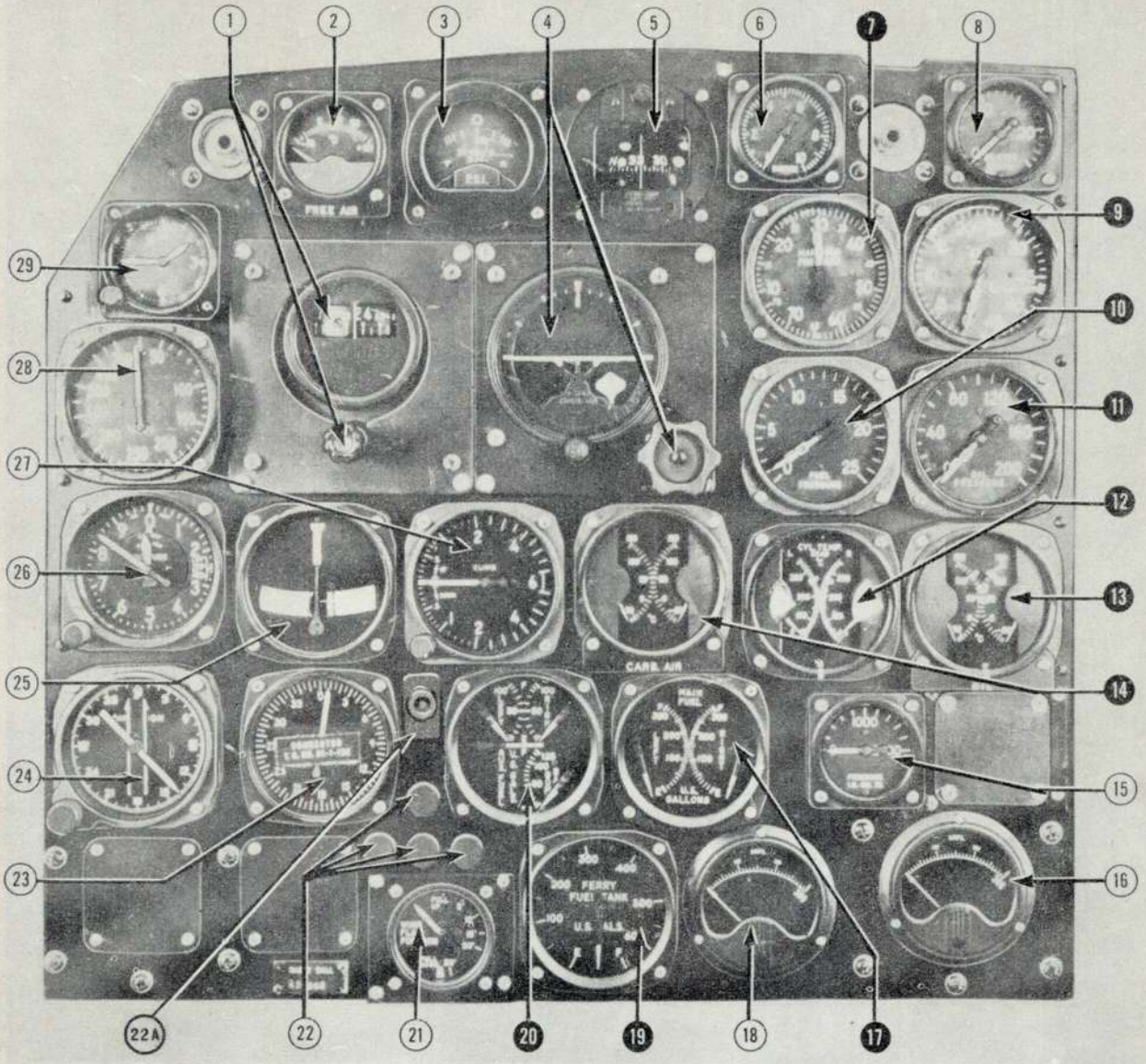
Figure 19 (Sheet 1 of 3)—Instrument Panel



1. Drectional Gyro (Turn) Indicator and Setting Knob
2. Outside (Free) Air Indicator
3. Radio Compass Left-Right Indicator
3A.—Marker Beacon 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)

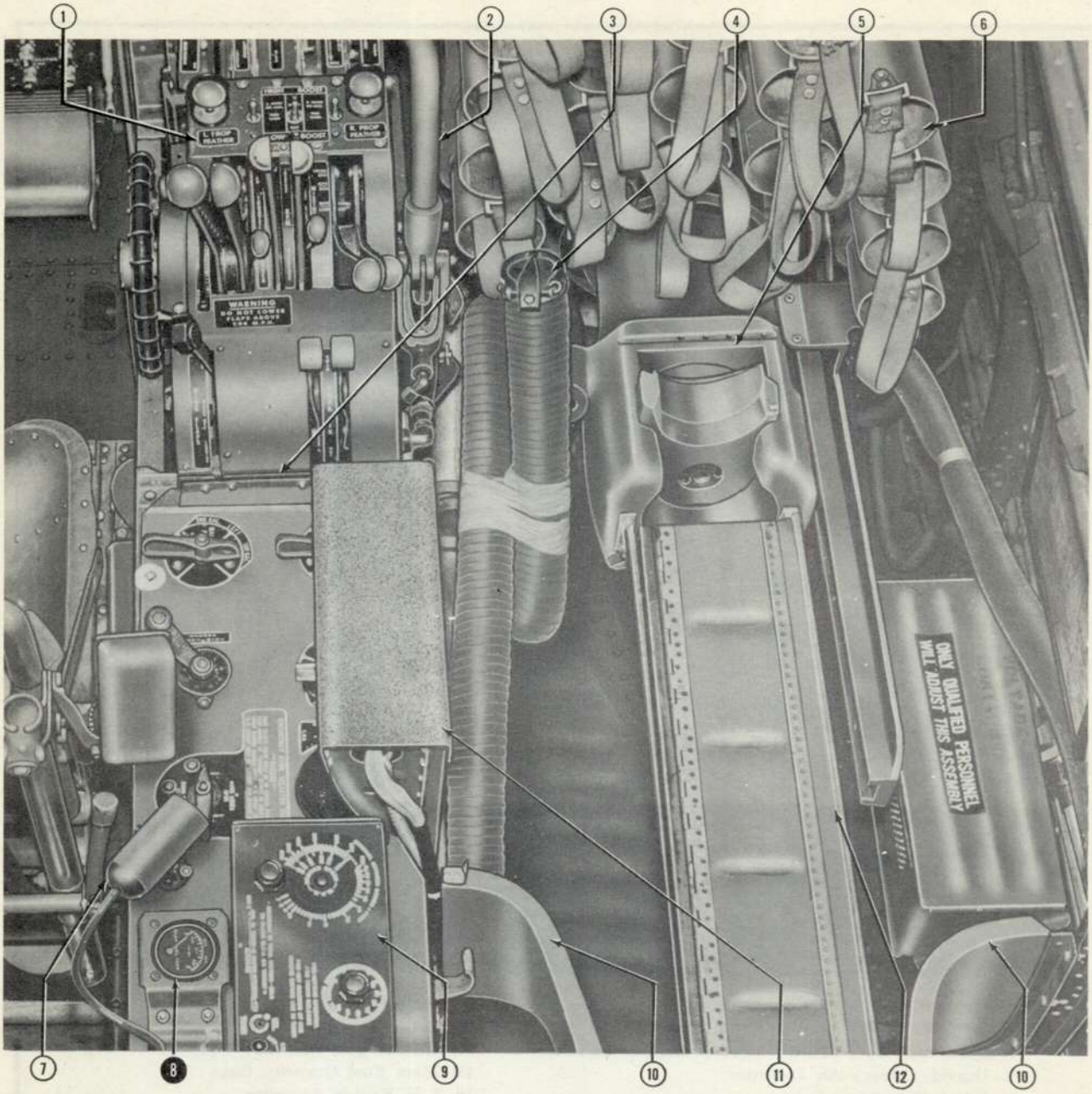
Figure 19 (Sheet 2 of 3)—Instrument Panel



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
22A.—Marker Beacon Indicator
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)

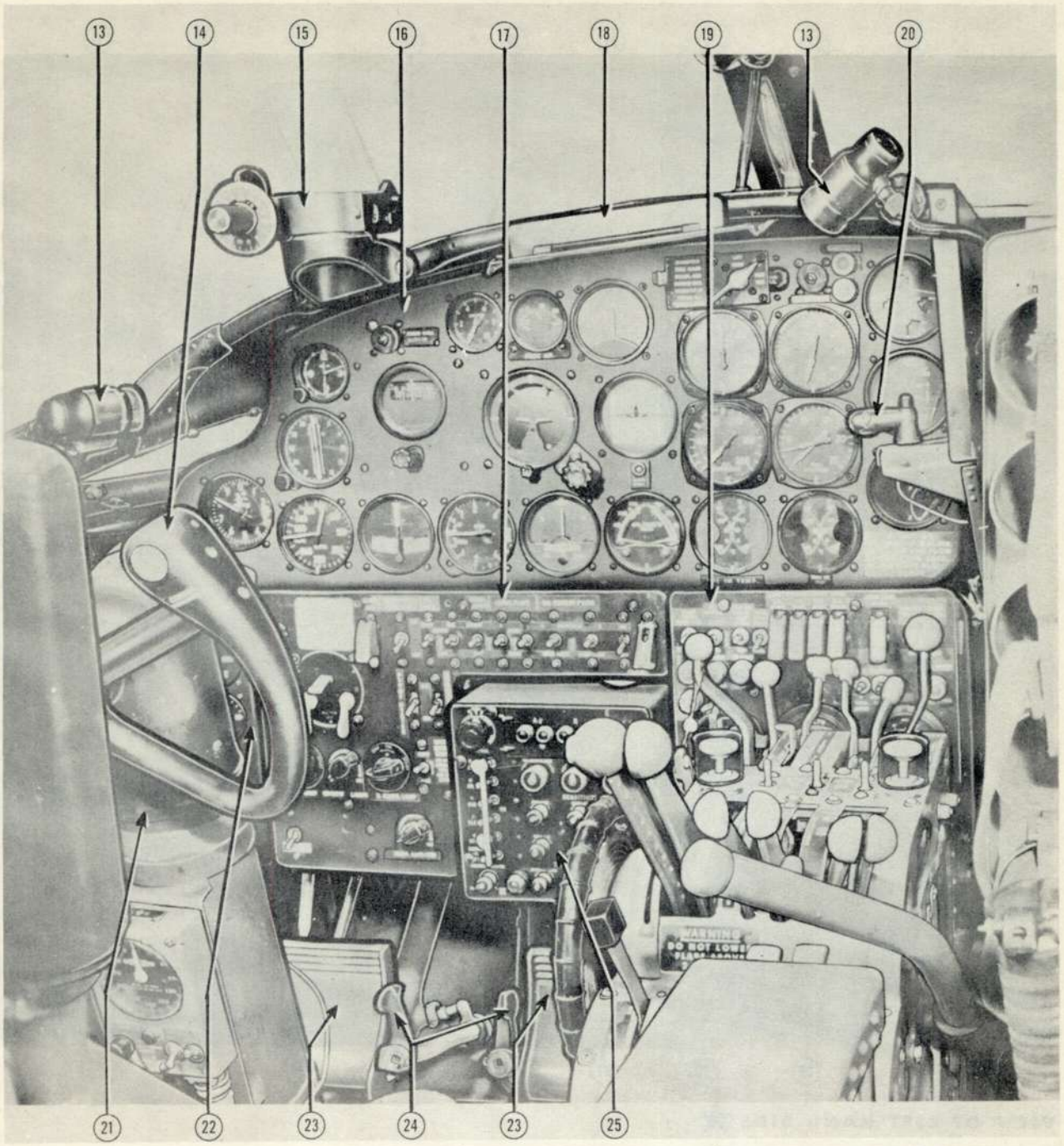
Figure 19 (Sheet 3 of 3)—Instrument Panel



★ 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

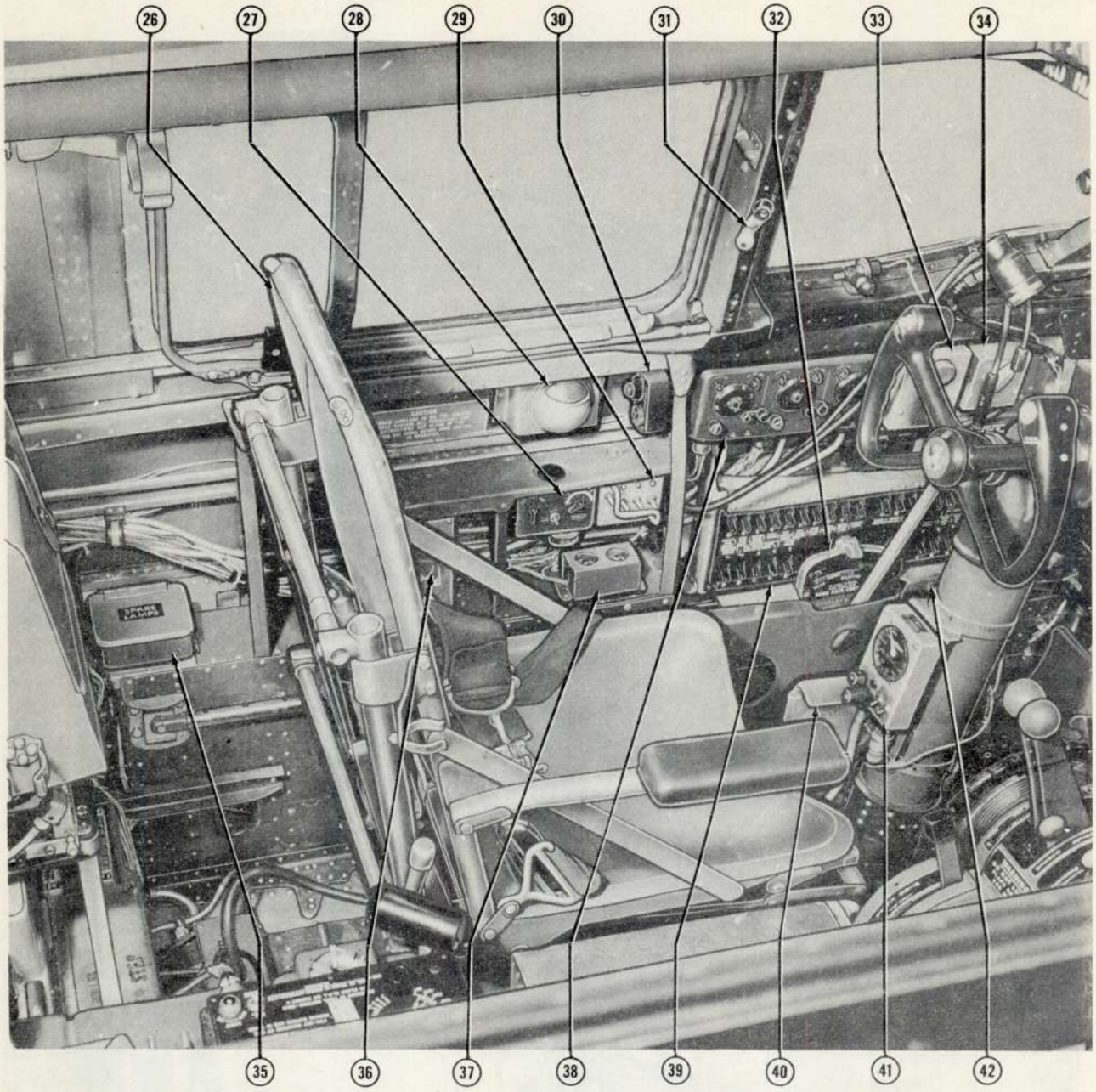
Figure 20 (Sheet 1 of 6)—Pilot's Compartment (on Early Airplanes)



★ 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)

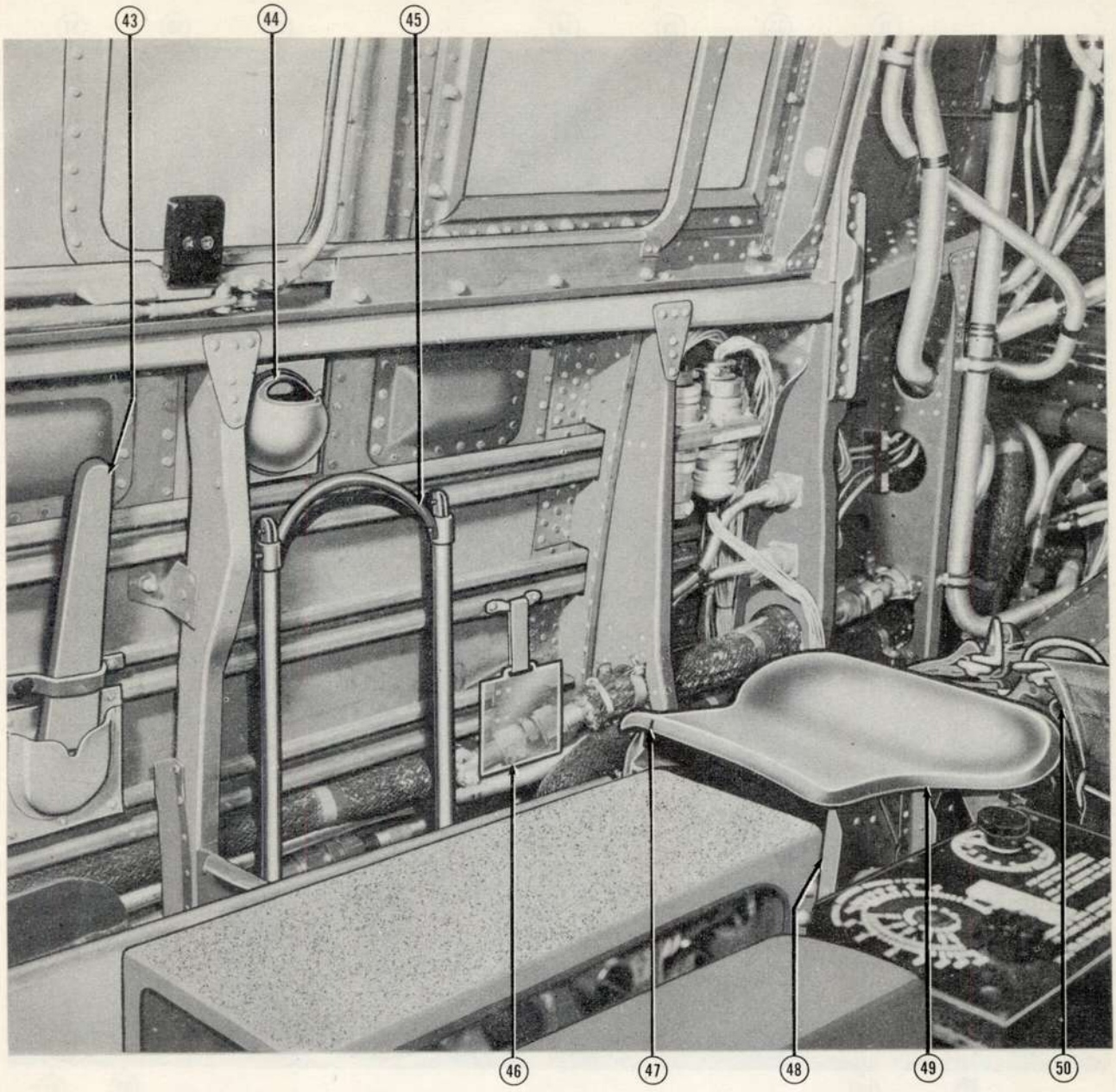


VIEW OF LEFT HAND SIDE ★

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)

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

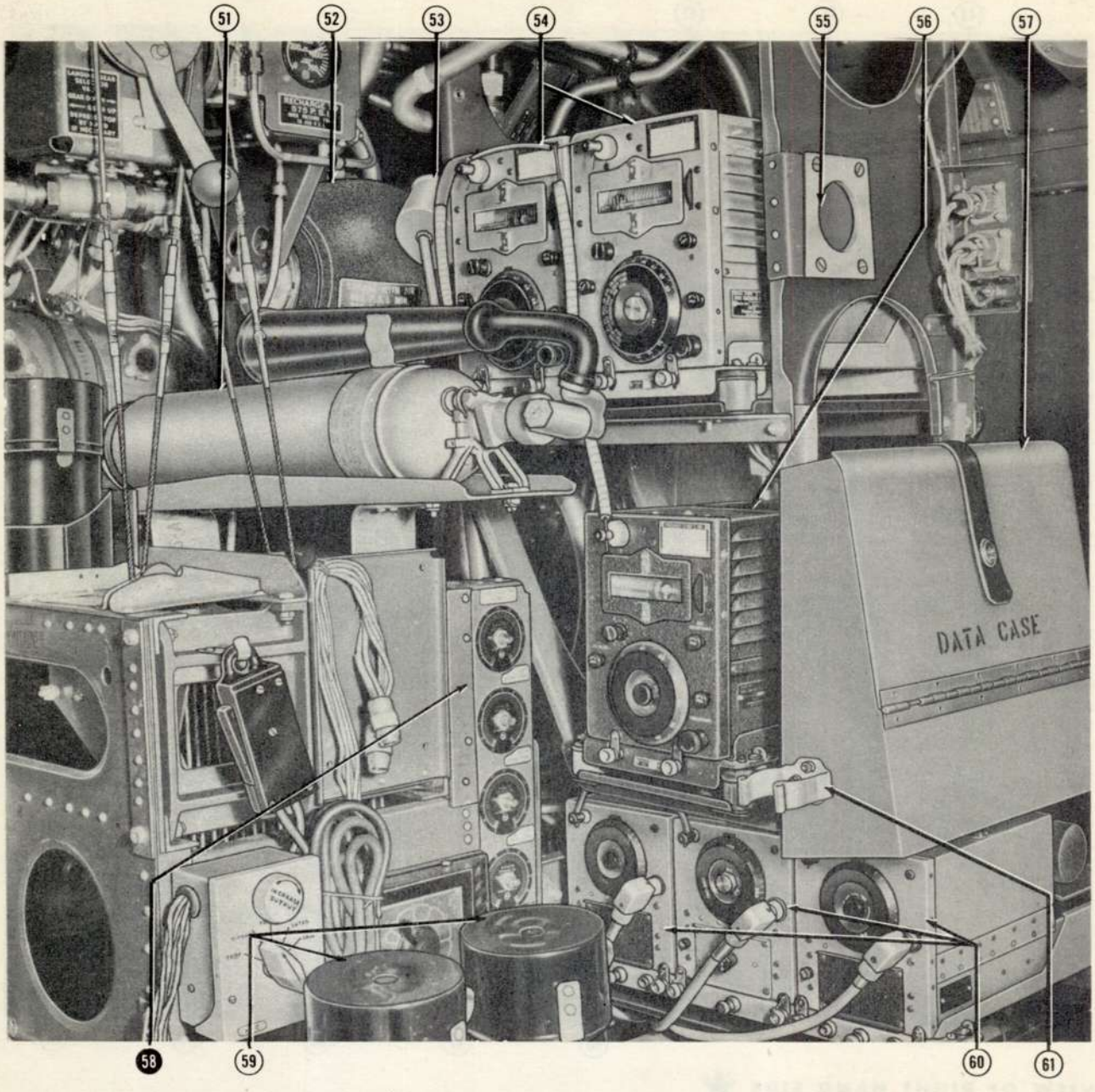
Figure 20 (Sheet 3 of 6)—Pilot's Compartment (on Early Airplanes)



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)

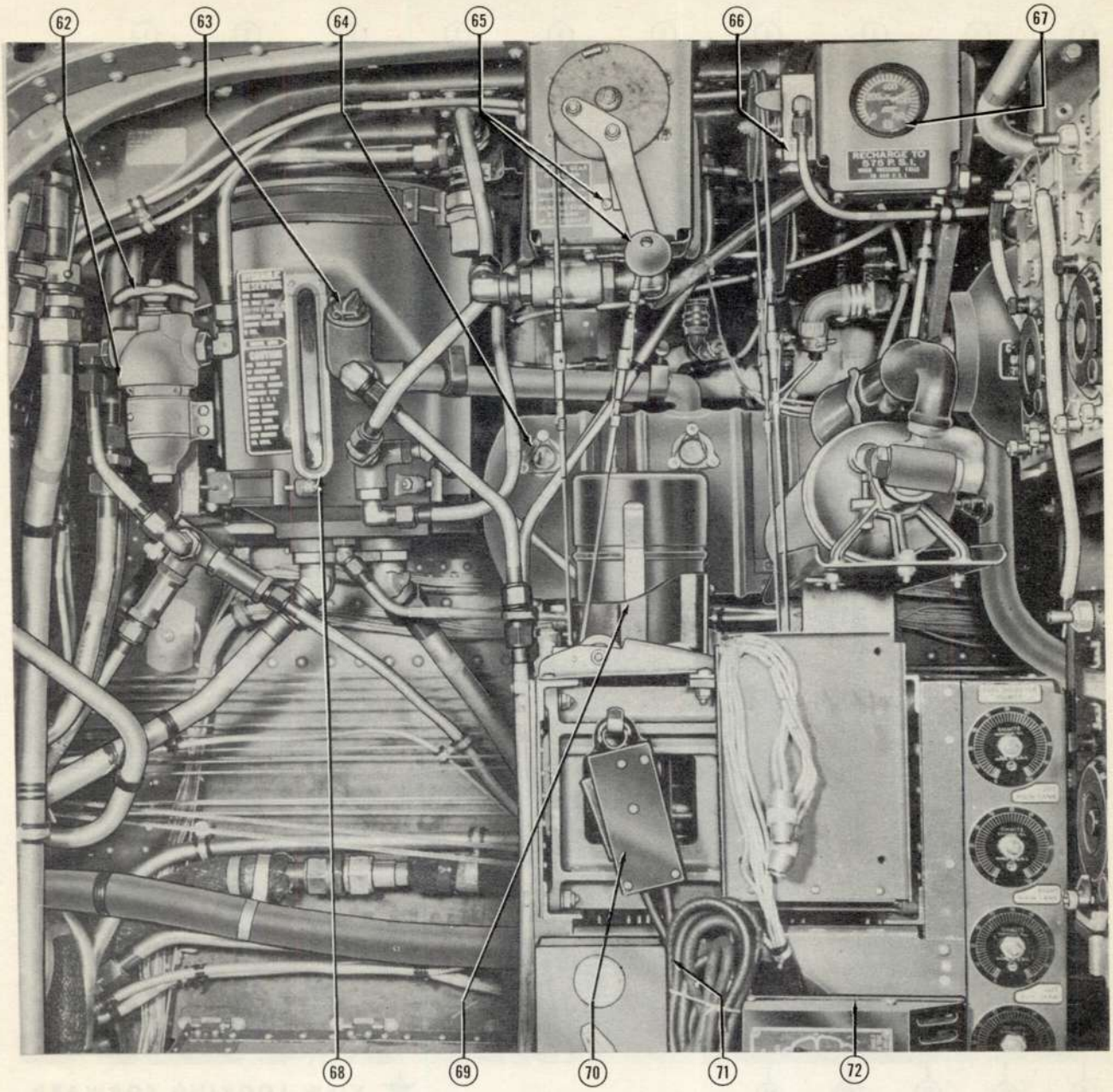


AFT VIEW (LEFT HAND SIDE) ★

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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

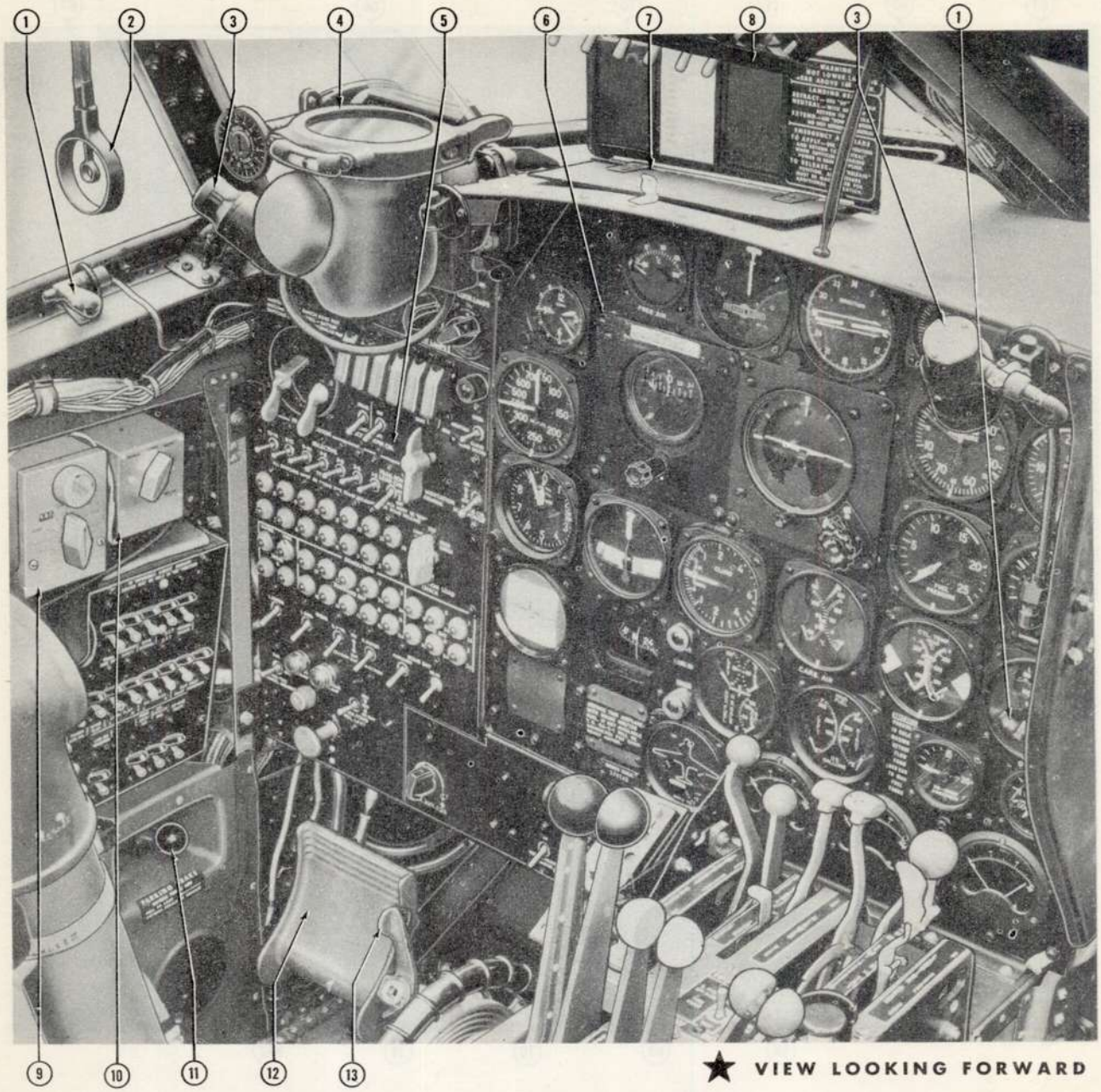
Figure 20 (Sheet 5 of 6)—Pilot's Compartment (on Early Airplanes)



AFT VIEW (RIGHT HAND SIDE) ★

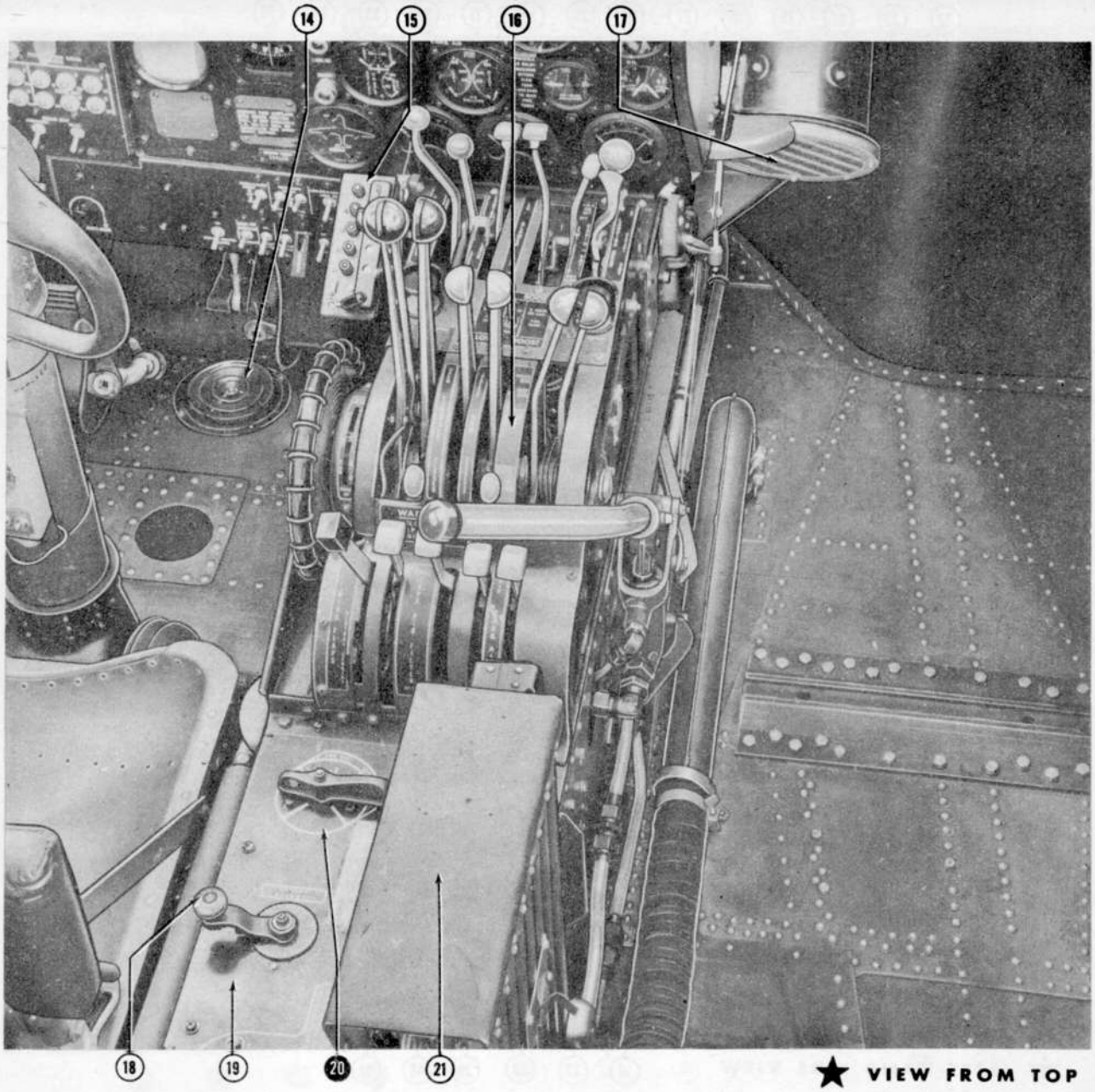
62. Hydraulic Filter and Filter Handle
63. Hydraulic Reservoir Filler Neck
64. Emergency Hydraulic Reservoir Fluid Level Inspection Windows
65. Auxiliary Landing Gear Control and Solenoid Pin
66. Emergency Air Brake Selector Valve
67. Emergency Air Brake System Pressure Gage
68. Hydraulic Reservoir Sight 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

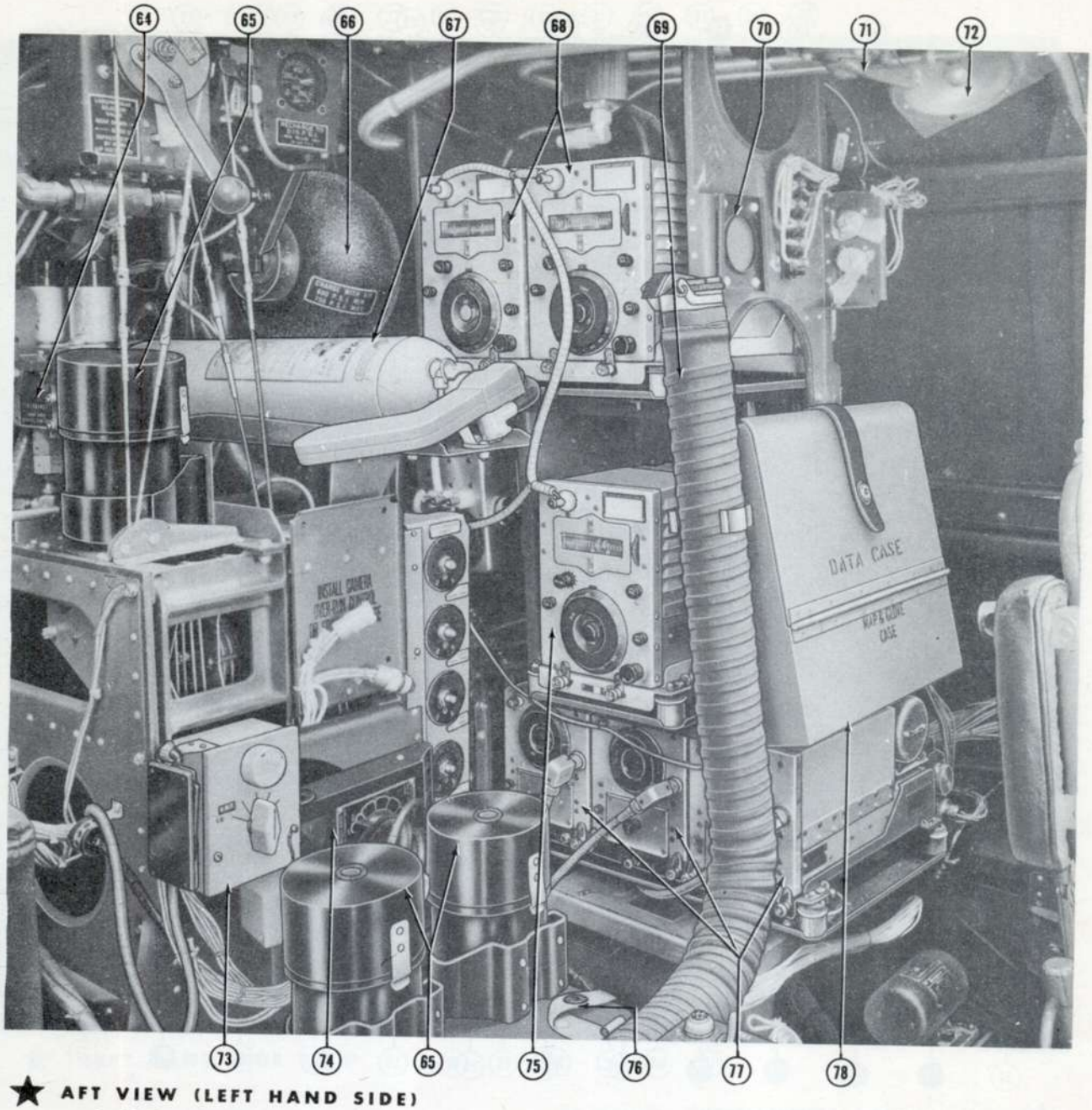
Figure 21 (Sheet 1 of 6)—Pilot's Compartment (on Intermediate Airplanes)



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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

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

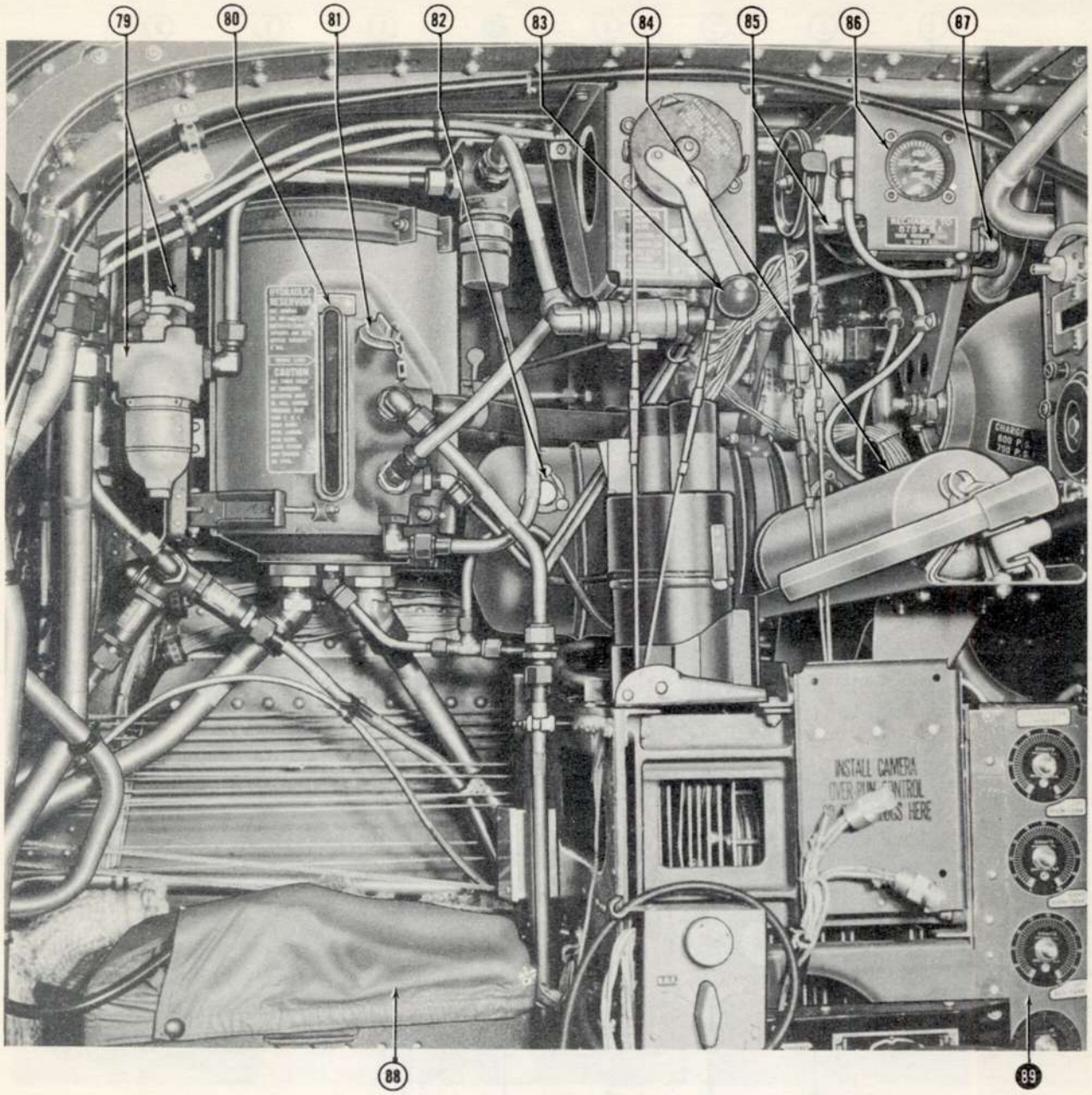


★ **AFT VIEW (LEFT HAND SIDE)**

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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

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

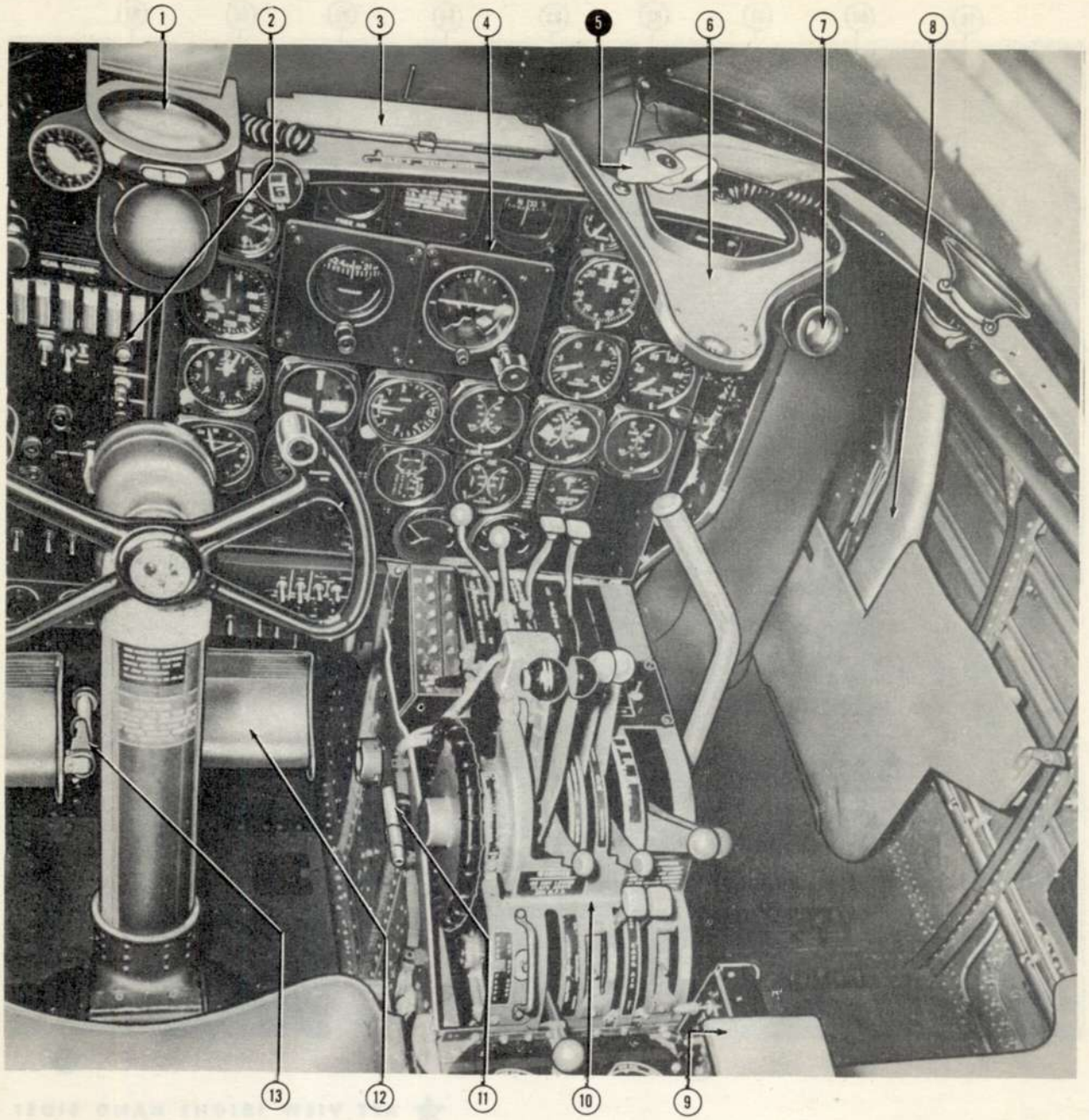


★ AFT VIEW (RIGHT HAND SIDE)

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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

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

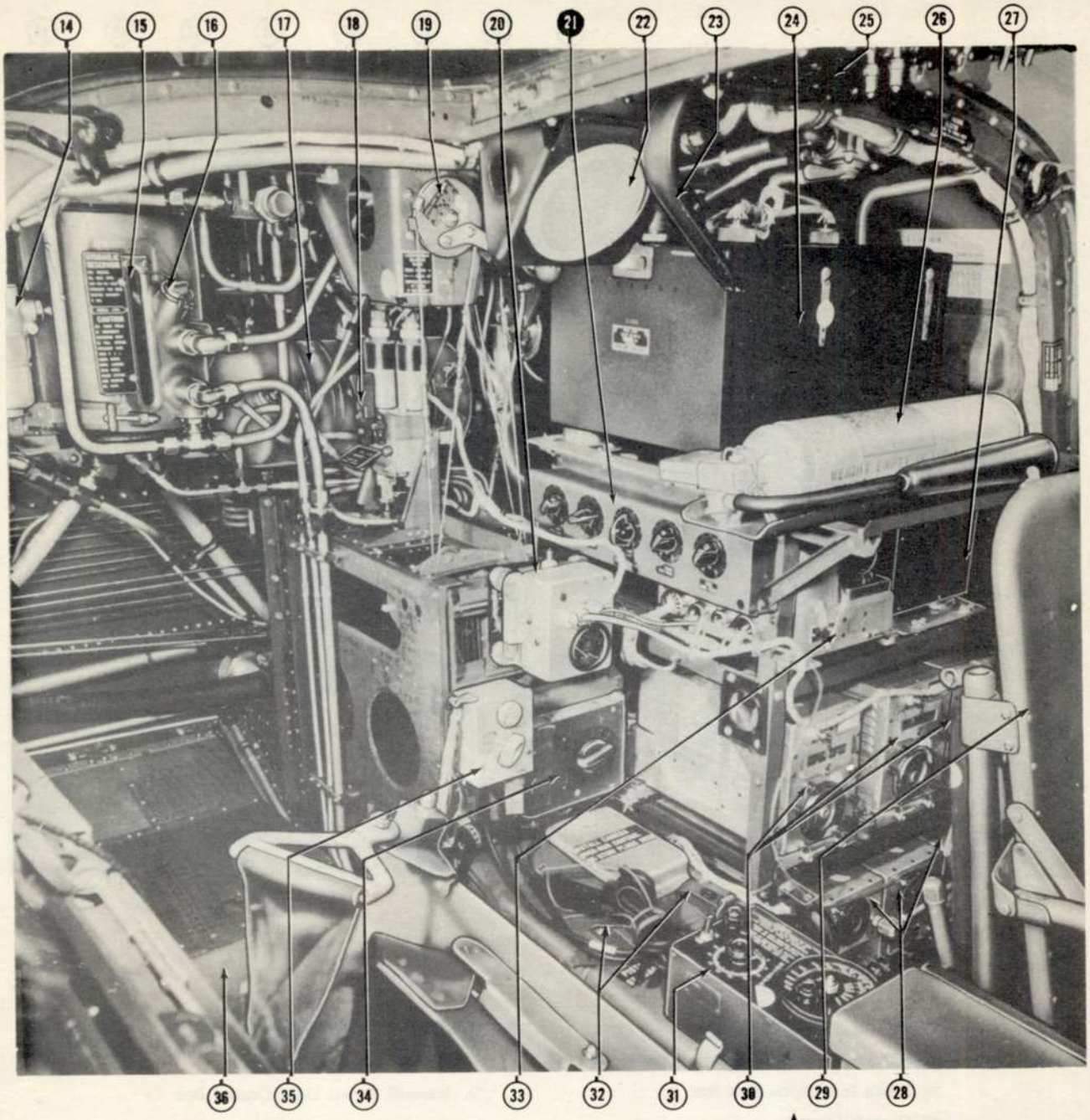


★ VIEW LOOKING FORWARD

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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

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

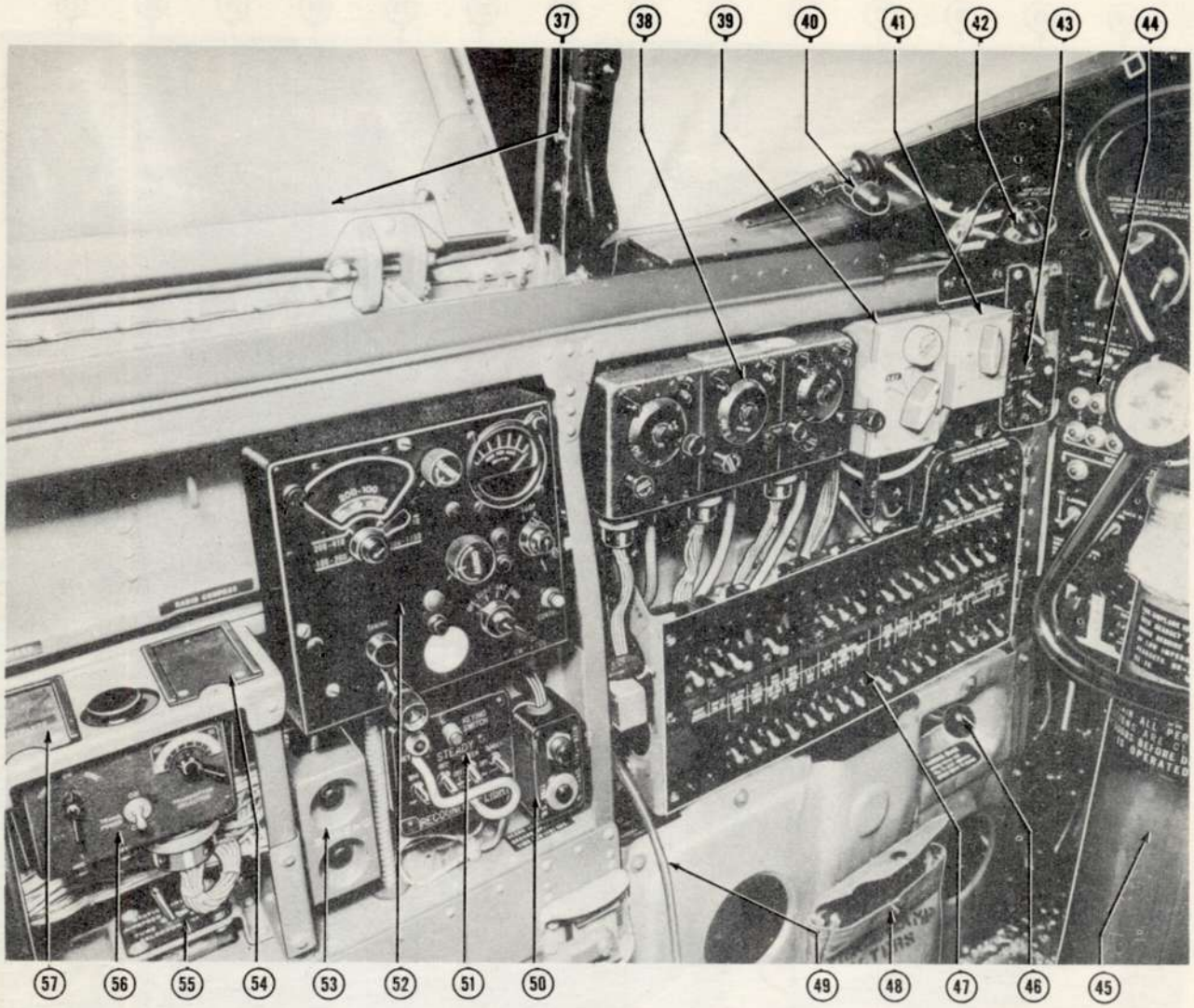


★ VIEW LOOKING AFT

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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

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

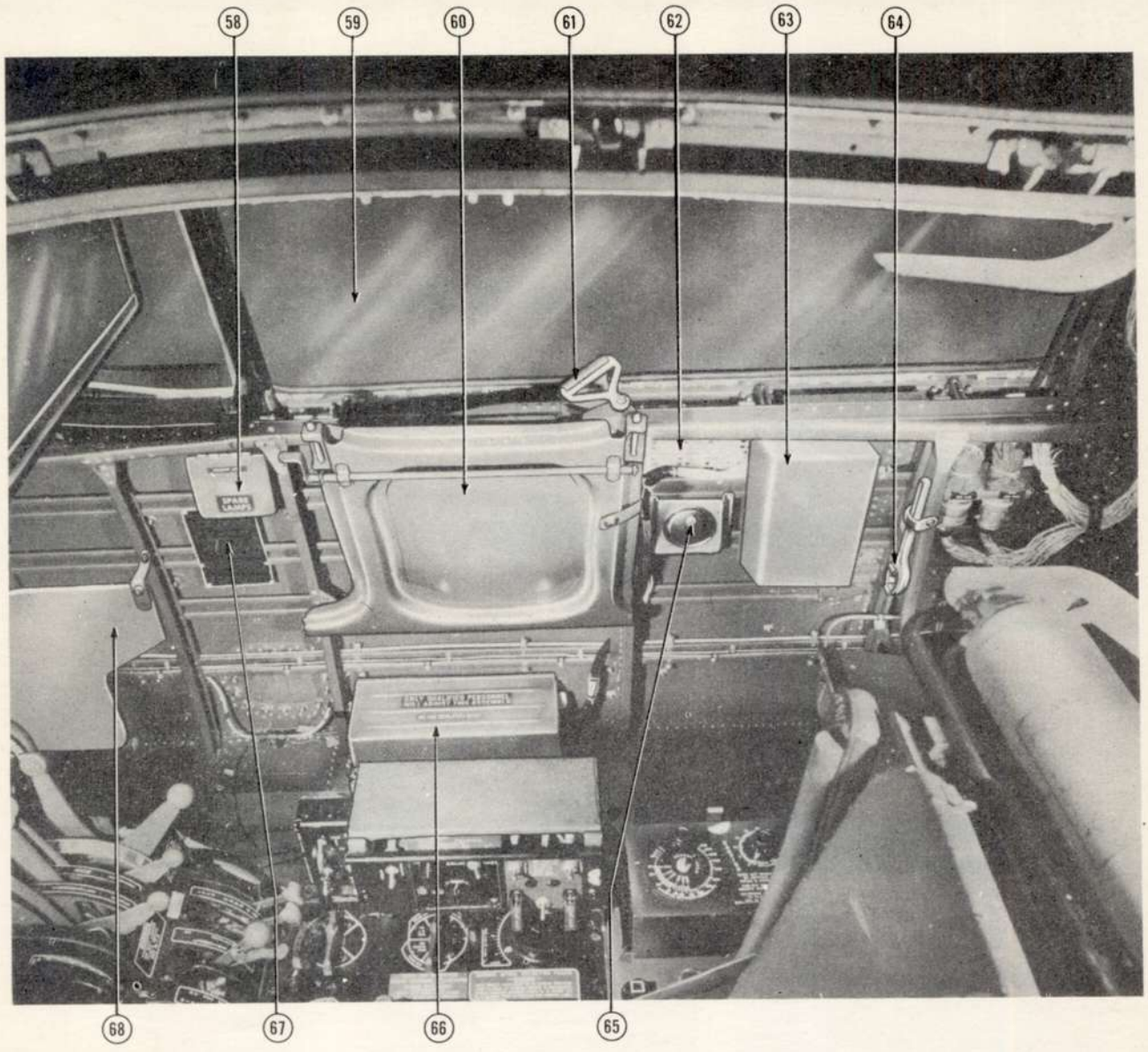


★ VIEW OF LEFT HAND SIDE

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

Note: Radio Sets SCR-274-N and SCR-522-A Have Been Replaced by AN/ARC-3 on Some Airplanes

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

(8) Dropping of M-10 Smoke Tanks (empty) ..... 350 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.

c. MAXIMUM TAKE-OFF GROSS WEIGHT 35,000 lb.

WARNING

No personnel will occupy rear gunner's compartment while airplane is in flight unless controls for emergency operation of bomb bay doors are installed in rear compartment. Crew members or passengers should not occupy the nose compartment during take-off or landing.

Note

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

d. ENGINE OVERSPEEDING.

If engine overspeeding occurs, land at the nearest base. Note all conditions of overspeeding on Form 1. If engine rpm was between 3100 and 3400 rpm the engine must be inspected before further flight. If engine rpm exceeded 3400 rpm the engine must be changed.

1A. MINIMUM CREW REQUIREMENTS.

The minimum crew requirements for this airplane are a pilot and one crew member familiar with the mechanical system of the airplane. Additional crew members as required will be added at the discretion of the Commanding Officer.

2. BEFORE ENTERING PILOT'S COMPARTMENT.

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

b. Nose gear torque arms connected and inspect disengaging plunger for locked position by pulling T-handle.

Note

It is necessary to disconnect the disengaging plunger and torque arms prior to towing. Plunger and torque arms should be engaged after towing and in all cases must be installed before take-off.

c. Landing gear safety pins – Removed and stowed.

d. Wheels – Chocked.

e. Fire extinguisher indicator discs in place.

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

g. Remove pitot head cover.

h. Visually check gunner and bombardier escape hatches for security of latches.

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

j. 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 footholds 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) Check life raft hatch and handles for security (some airplanes).

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

(2) Hydraulic filter – turn handle three or four times.

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

(4) Instrument vacuum selector valve control – in the applicable position for the engine that is started first – left-hand or right-hand engine.

(5) Generator switches – Check on.

(6) Emergency canopy release – Safetied.

(7) Engine oil and hydraulic fluid shutoff switch, if installed, "OPEN" *(15, figure 18).*

(8) Emergency hydraulic system selector valve control – "SYSTEM."

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

(10) Fuel tank selector valve controls – "MAIN ON."

(11) Auto pilot master switch – "OFF."

(12) 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.

(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 air planes, incorporating automatically controlled doors, set switch in the "AUTO" position. 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."

(14) Carburetor air temperature control levers – "COLD."

CAUTION

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

(15) Landing gear control lever – "DOWN."

(16) Wing flaps control – "NEUTRAL."

(17) Mixture controls – "IDLE CUT-OFF."

(18) Propeller controls – "INCREASE RPM."

(19) Fuel booster pump switches – "OFF."

(20) Supercharger control levers – "LOW."

(21) Surface controls lock lever – "UNLOCK" position. Check flight controls for freedom of movement or slack. Set trim tabs at 0.

(22) Emergency air brake – "RELEASE."

(23) Parking brake control lever – SET.

(24) Seat and rudder pedals – Adjust as necessary.

(25) Hydraulic hand pump lever – Actuate lever and observe the hydraulic pressure gage for pressure increase.

(26) Alarm bell – Check operation.

(27) Water injection switches – "OFF."

(28) Carburetor air filter controls – "DIRECT" position. If dust conditions are present – "FILTER."

(29) Circuit breakers – Check.

(30) Master ignition switch – "ON."

(31) Battery switches "OFF" ("ON" if external power is not used).

(32) 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 dam-

age the radio and other electrical equipment.

(33) Fuel quantity gages – Adequate supply.

(34) Oxygen equipment – Check operation and 400 psi pressure (some airplanes).

(35) Compass and electrical instruments – Check for proper settings and indications.

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 instrument 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 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 "CENTER 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.)

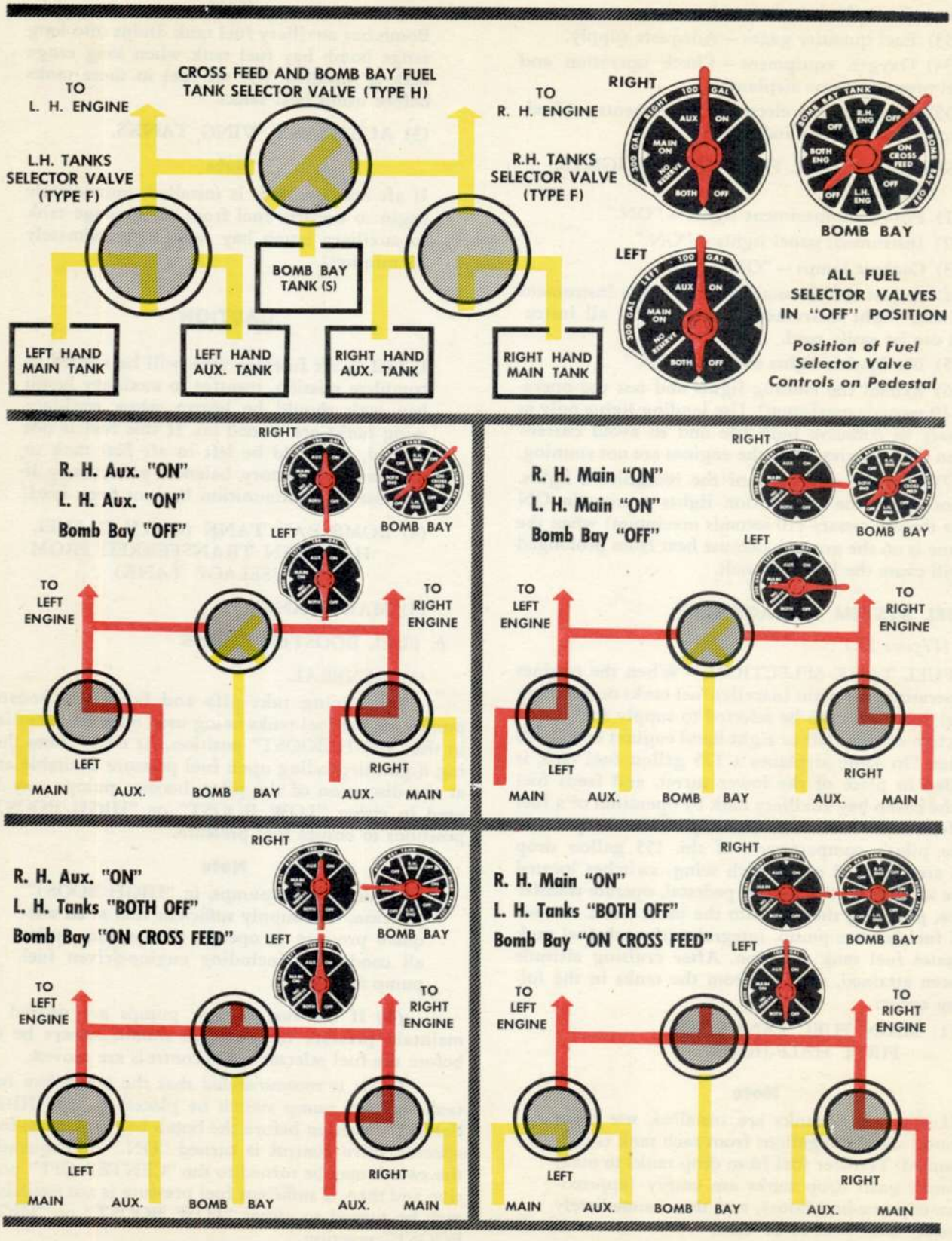


Figure 23 (Sheet 1 of 2)—Alternate Positions of Fuel Tank Selector Valves

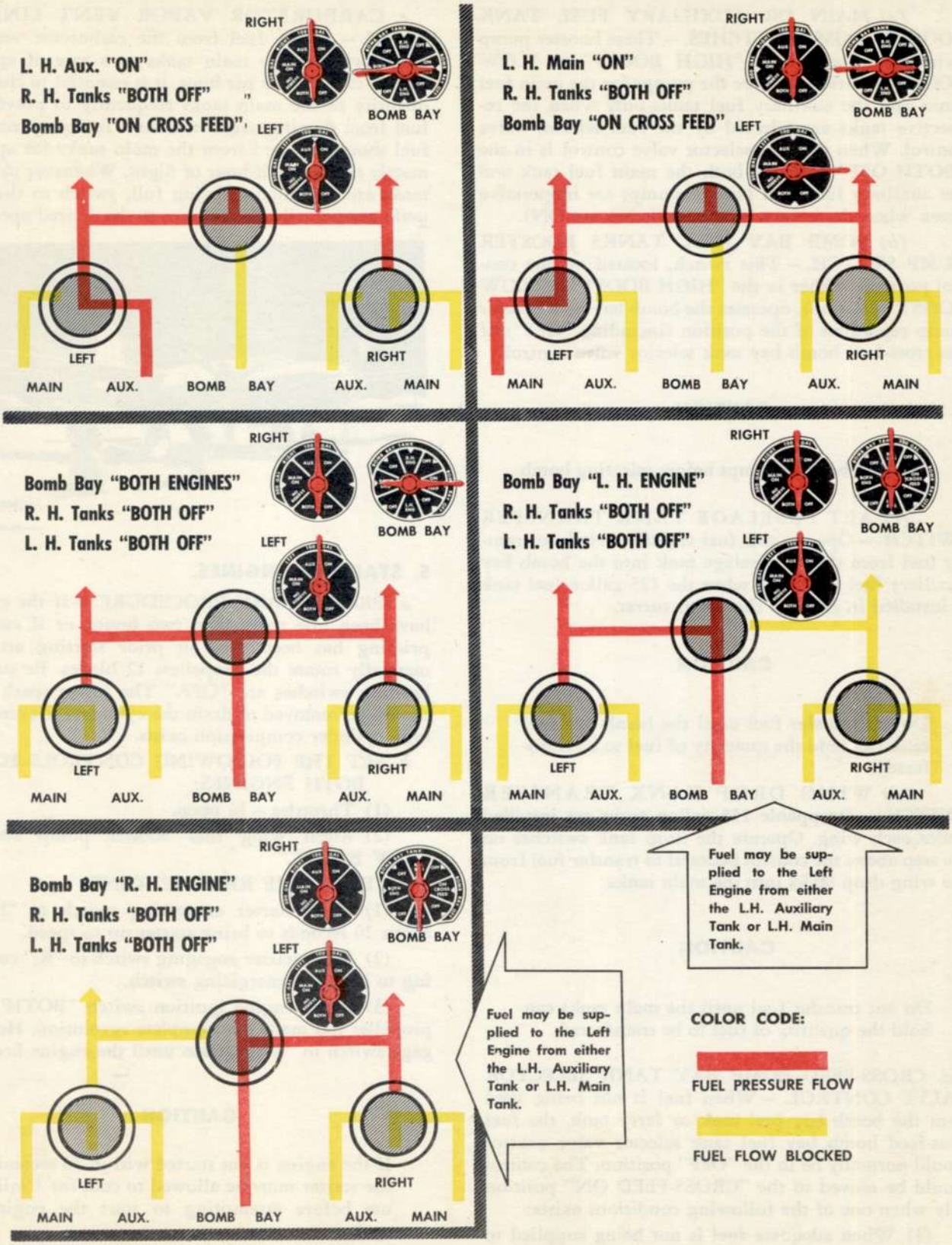


Figure 23 (Sheet 2 of 2)—Alternate Positions of Fuel Tank Selector Valves

(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.

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) Throttles – ¼ open.

(2) Right wing fuel booster pump switch – "LOW BOOST."

c. START THE RIGHT ENGINE.

(1) Move starter energizing switch to "R" for about 20 seconds to bring starter up to speed.

(2) Move starter engaging switch to "R," continuing to hold the energizing switch.

(3) Right engine ignition switch "BOTH" after propeller has made one complete revolution. Hold engage switch in "R" position until the engine fires.

CAUTION

If the engine is not started within 30 seconds, the starter must be allowed to cool for 1 minute before attempting to start the engine again.

(4) Right wing fuel booster pump switch – "LOW BOOST."

(5) Fuel primer switch – "ON," hold until after the engine has started and the engine speed stabilizes.

CAUTION

If oil pressure is not indicated within 30 seconds, stop the engine and investigate.

(6) Mixture control – "AUTO RICH." To prevent backfiring, movement of the mixture control should occur slightly before disengaging the primer in order to allow the carburetor to come up to operating pressures and start functioning in a normal manner.

(7) Fuel primer switch – "OFF."

(8) (Deleted)

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

(a) Overload 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, that has been discharged by the carburetor, 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) (Deleted)

(11) Run engines at 1000 rpm until oil temperature reaches 40°C.

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) Hydraulic pressure gage – within limits.

(14) 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.

(15) Suction gage – within limits.

d. START THE LEFT ENGINE. – The starting procedure for the left engine is the same as that for the right engine.

e. 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 shutoff 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.

Note

Ground operation should be held to a minimum to prevent or combat lead and other fouling accumulations on the spark plugs and in the combustion chamber. When it is necessary to run an engine on the ground for an extended period of time, it shall be run up with the propeller in low pitch (high rpm) at a manifold pressure equal to the field barometric pressure for a period of one minute at ten minute intervals.

a. WARM-UP OPERATIONS.

(1) Run the engines at the smoothest rpm between 1200 to 1600 rpm after the oil temperature reaches 40°C.

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

(3) Operate the engines at 1200 to 1600 rpm until the following conditions exist:

(a) Oil temperature – within limits.

(b) Oil pressure – within limits.

(c) Cylinder head temperature – within limits.

(4) Do not close cowl flaps.

Note

It may be required, when the weather is cold, to control cowl flap position on this airplane so that cylinder temperatures will be within operating limits for take-off. Closing the cowl

flaps beyond one-third open must be avoided to eliminate danger of hot spots in the cylinders.

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

(6) Accomplish the following ignition switch check before taxiing:

(a) Throttles – 700 rpm.

(b) Master ignition switch "OFF" momentarily. Observe that the engines completely cease firing. Perform this check as rapidly as possible in order to prevent severe backfire when the switch is pushed on again.

(c) If either or both engines do not cease firing, shut down the engines and be sure personnel keep clear of the affected propeller until the difficulty has been remedied. The switch may be defective or a magneto ground lead may be open.

CAUTION

The usual system check before take-off will be unreliable when magneto ground lead trouble exists.

(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) 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.

CAUTION

When operating on terrain where small stones, gravel or foreign objects may be picked up by the propeller, the propeller control should not be moved to the full low rpm position. During the propeller governor check, the propeller control should be immediately returned to the high rpm position at the initial sign of an rpm drop.

(2) CRUISING FUEL-AIR MIXTURE CHECK.

(a) Mixture controls – "AUTO RICH."

(b) Throttles 1700 rpm.

(c) After engine speed and instruments have stabilized, move mixture controls to "AUTO LEAN."

(d) Observe the engine rpm change. A change of over 25 rpm or 75 rpm decrease as a result of the mixture change indicates an excessively rich or lean carburetor. If the engine speed varies more than this amount, this test should be repeated at three or four other engine speeds, less than ignition check speed, to further determine the extent of richness or leanness.

(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.

(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 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) ENGINE CHECK. – With parking brake applied, run up both engines at the same time to field barometric pressure; then check the engine rpm, fuel pressure, cylinder head temperature, oil pressure and oil temperature to make certain that all indications are within limits.

CAUTION

Both engines must be run up simultaneously in order to avoid damage to the nose wheel strut.

(5) 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.

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

1. If the "drop off" exceeds 65 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.

(6) ACCELERATION AND DECELERATION CHECK.

(a) Mixture control – "AUTO LEAN."

(b) Check acceleration and deceleration of the engine. The engine should accelerate rapidly and smoothly with no tendency to backfire. Do not exceed 2100 rpm.

(c) Repeat the check with the mixture control in "AUTO RICH."

(7) IDLE SPEED CHECK.

(a) Throttles – Closed.

(b) Idle speed should be 600 rpm.

(8) 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 "BOTH 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."

(9) VACUUM PUMP CHECK. – 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.

(10) ADDITIONAL CHECKS.

(a) Battery cart (if used) – Disconnected.

(b) Battery switches *(Figure 10)* – "ON."

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

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

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

(f) All obstructions clear of the airplane.

(g) Wheel chocks – Removed.

(h) Instruments – Check for desired range.

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."

Note

Sudden or severe application of brakes during taxiing or landing should be avoided insofar as practicable. A thorough inspection of the landing gear assembly shall be made after hard landing or severe use of brakes.

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.

CAUTION

Attempt directional control only after forward roll has started.

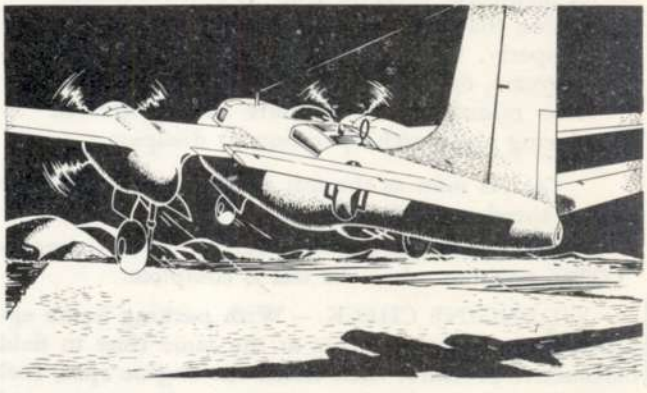
d. Avoid taxiing over rough or soft terrain or through tall grass; but if it is necessary to do so, use minimum forward speed. Carefully observe the terrain to be traversed by the nose wheel; sinking or dropping of the nose wheel to a lower level than normal subjects the nose wheel strut to heavy loads. 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.

WARNING

Crew members or passengers should not occupy the nose compartment during take-off or landing.

a. SAFETY CHECK BEFORE TAKE-OFF.

(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) Trim tab controls *(8, figure 17; 7 and 11, fig-18)* – "0" degrees.

(4) Carburetor air temperature controls *(14, figure 17)* – Full "COLD."

(5) Mixture controls – "AUTO RICH."

(6) Propeller governor controls – "INCREASE RPM."

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

(8) Bomb bay booster pump switch – "OFF."

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

(10) Cowl flaps – ½ open.

(11) Canopy and hatches – Locked.

(12) Oil cooler door switches – Readjust as necessary to maintain an oil temperature within the limits specified in the Flight Operation Instruction Charts, Appendix 1. On later airplanes the doors are automatically controlled when the switch is placed in the "AUTO" position.

(13) Bomb bay doors *(Figure 9)* – "CLOSED."

(14) Altimeter *(26, figure 19, sheet 3)* – Set at proper reading.

(15) Gyros – Uncaged.

(16) Cockpit heater master switch – "OFF."

(17) Instruments – Check for desired range.

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 check.

CAUTION

Both engines must be run up simultaneously in order to avoid damage to the nose wheel strut.

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. Make a check for rpm and manifold pressure during initial take-off speed.

(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 (LB.)	27,000	32,000	35,000
Flap Setting	Indicator	Airspeeds	(MPH)
20 degrees	94	103	100
*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. Do not use brakes to stop wheel rotation during retraction of landing gear or during flight.

(8) Wing flap control *(13, figure 17)* – "UP" (move control to "NEUTRAL" or "OFF" after flaps are up).

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

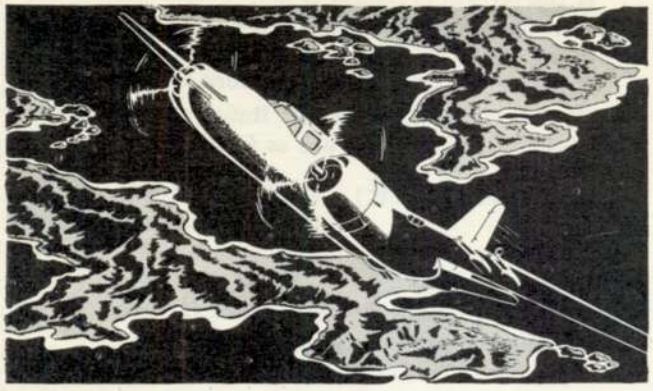
(10) Retract landing lights (if used) as soon as climb is established.

(11) (Deleted)

(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.

For engine failure during take-off refer to Section IV.



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.

i. Fuel booster pump switches – As required.

j. De-icer switch – As required.

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 MAC 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 ten minutes duration at each odd hour of the clock 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 autopilot 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 autopilot 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 autopilot 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) (Deleted)

(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.

12A. TURBULENT AIR AND THUNDERSTORM FLYING.

Note

Flight through a thunderstorm should be avoided if it is at all possible. However, since circumstances may force you at some time to enter a zone of severe turbulence, you should be familiar with the techniques recommended for flying the airplane under such conditions.

a. GENERAL. – Power setting and pitch attitude are the keys to proper flight technique in turbulent air. The power setting and pitch attitude required for the desired penetration airspeed *(Figure 23A),* and established before entering the storm must – if maintained throughout the storm – result in a constant airspeed, regardless of any false readings of the airspeed indicator. Specific instructions for preparing to enter a storm and flying in it are given in the following paragraphs.

b. APPROACHING THE STORM. – It is imperative that you prepare the airplane prior to entering a

zone of turbulent air. If the storm cannot be seen its proximity can be detected by radio crash static. Prepare the airplane as follows:

(1) Disengage auto-pilot.

(2) Propeller controls 2200 rpm for gyroscopic stability.

(3) Mixture controls "AUTO RICH."

(4) Pitot tube heater switch – "ON."

(5) Carburetor heat – As required.

(6) Throttles adjusted as necessary to obtain penetration speed. *(See figure 23A.)*

(7) Check suction gage for desired reading and gyro instruments for proper settings.

(8) Safety belt tightened. (Check with crew members.)

(9) Turn off any radio equipment rendered useless by static.

(10) At night, turn cockpit lights full bright or use dark glasses to minimize blinding effect of lightning.

CAUTION

Do not lower gear and flaps as they merely decrease the aerodynamic efficiency of the airplane.

c. IN THE STORM.

(1) Maintain power setting and pitch attitude (established before entering the storm) throughout the storm. Hold these constant and your airspeed will be constant – regardless of the airspeed indicator.

(2) Devote all attention to flying the airplane.

(3) Expect turbulence, precipitation, and lightning, and don't allow them to cause undue concern.

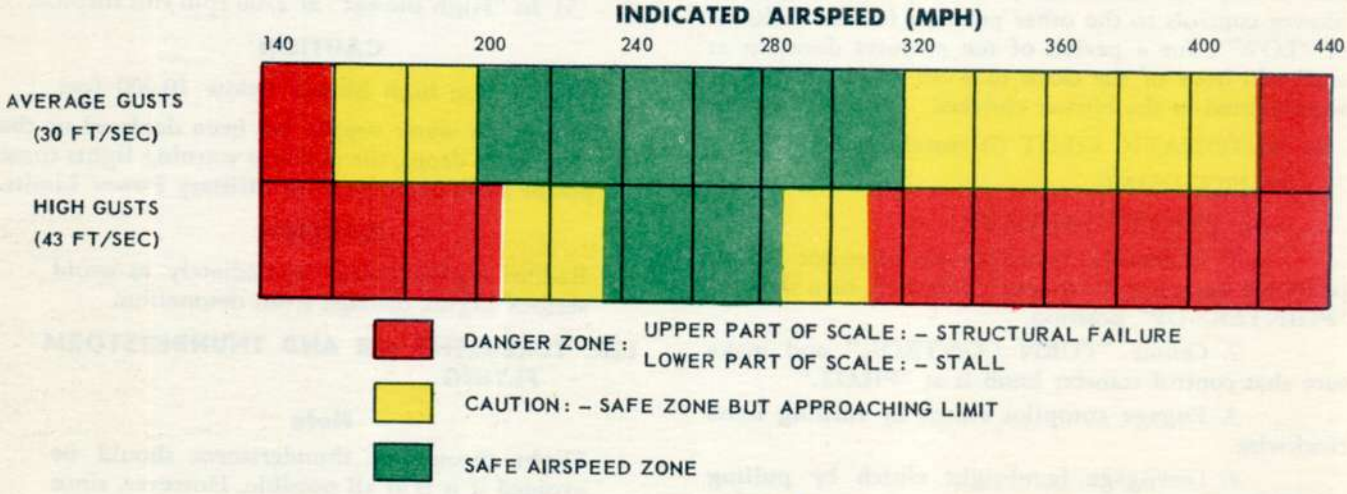
(4) Maintain attitude. Concentrate principally on holding a level attitude by reference to the artificial horizon.

Note

Penetration speeds should be held within the lower portion of the safe (green) zone for penetrations at any gross weight over 27,000 lb., and up to and including 35,000 lb.

TURBULENT AIR PENETRATION SPEEDS

FOR DESIGN GROSS WEIGHT OF 27,000 POUNDS



NOTE

Penetration speeds should be held within the lower portion of the safe (green) zone for penetrations at any gross weight over 27,000 lbs., and up to and including 35,000 lbs.

Figure 23A. Turbulent Air Penetration Speeds

(5) Don't chase th airspeed indicator, since doing so will result in extreme airplane attitudes. If a sudden gust should be encounte. d while airplane is in nose high attitude, a stall might easily result. A heavy rain, by partial blocking of the pitot tube pressure head, may decrease the indicated airspeed reading by as much as 70 mph.

(6) Use as little elevator control as possible to maintain your attitude in order to minimize the stresses imposed on the airplane.

(7) The altimeter is unreliable in thunderstorm flying because of differential barometric pressures within the turbulent area. A gain or loss of several thousand feet may be expected. Make allowance for this error in determining minimum safe altitude.

Note

Normally, the least turbulent area in a thunderstorm will be at altitudes up to 6000 feet above the terrain. Altitudes between 10,000 feet and 20,000 feet are usually the most turbulent.

13. STALLS.

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

GROSS WEIGHT (LB.)	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 airspeed 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.

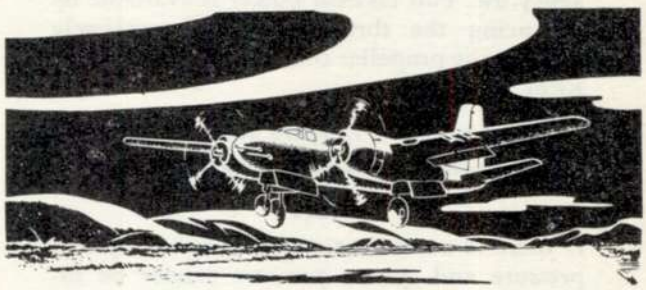
(2) POSITION AND FORMATION LAMPS. – The position and formation lamp switches are located on the main electrical control panel.

(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.

WARNING

Crew members or passengers should not occupy the nose compartment during take-off or landing.

a. NORMAL APPROACH AND LANDING.

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

(a) Armament switches – "OFF."

(b) Hydraulic reservoir – Check.

(c) Emergency air brake pressure – Check.

(d) Supercharger controls *(3, figure 17)* – "LOW."

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

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

(g) 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.

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

(i) Autopilot master switch – "OFF."

(j) Mixture controls – "AUTO-RICH."

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

(l) Fuel pressures – 16 to 25 pounds per square inch.

(m) De-icer system switch (if installed) – "OFF."

(n) Cockpit master heater switch – "OFF."

(o) 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.

(p) Cowl flaps *(3, figure 18)* – "CLOSED."

(q) Hydraulic system pressure gage – Check.

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.

(r) Landing gear control – "DOWN." Visually check the landing gear for complete extension.

CAUTION

Leave the control in "DOWN" position in order to utilize full down-line pressure. Never extend the gear at a speed over 160 mph IAS.

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

(t) Wing flap control *(13, figure 17)* – "LANDING" or "DOWN."

(u) 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.

CAUTION

Leave canopy closed until landing roll is completed. This will prevent stresses causing warping which will make subsequent latching uncertain.

(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 airspeed over the landing field boundary as given below:

GROSS WEIGHT (LB)	27,000	32,000
CONDITION	IAS (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.

Note

Sudden or severe application of brakes during taxiing or landing should be avoided insofar as practicable. A thorough inspection of the landing gear assembly shall be made after hard landings or severe use of brakes.

(g) Fuel booster pump switches *(7, figure 17)* – "OFF."

(h) Propeller controls – "INCREASE RPM."

(i) Cowl flaps *(3, figure 18)* – "OPEN." This facilitates the circulation of air over the engines. Re-

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.

Note

Sudden or severe application of brakes during taxiing or landing should be avoided insofar as practicable. A thorough inspection of the landing gear assembly shall be made after hard landings or severe use of brakes.

(g) Raise flaps at the 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.

18A. POST FLIGHT CHECK (LAST FLIGHT OF THE DAY).

a. After the last flight of the day, accomplish the following post flight check:

(1) Ignition switch check at 700 rpm.

(2) Cruising fuel-air mixture check at 1700 rpm.

(3) Engine power check at 30 in. Hg.

(4) Ignition system check at 30 in. Hg. (max drop 65 rpm).

(5) Idle speed and mixture check. With throttles against the idle stop, the engines, should idle at 450 rpm. When engine speed is stabilized, move the mixture control slowly with a smooth movement toward "IDLE CUT-OFF" and carefully observe the manifold pressure gage for any change in manifold pressure during this leaning procedure. When engine speed has dropped to 300 rpm during the leaning procedure, return the mixture control to "AUTO RICH." While leaning out the mixture with the mixture control, a decrease of more than ¼-inch manifold pressure during the leaning out indicates an excessively rich mixture. An immediate increase in manifold pressure not preceded by a momentary decrease in manifold pressure indicates that idle mixture is too lean.

sidual heat above 120°C (248°F) within the engine section may damage the spark plug electrical insulation.

(j) Oil cooler door switches – "OPEN" or "AUTO."

(k) Wing flap control–"UP" then "NEUTRAL."

(l) Parking brake control lever – SET.

CAUTION

Do not set parking brake control lever if brakes are hot.

(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 takeoff 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.

18A. POST FLIGHT CHECK (LAST FLIGHT OF THE DAY).

a. After the last flight of the day, accomplish the following post flight check:

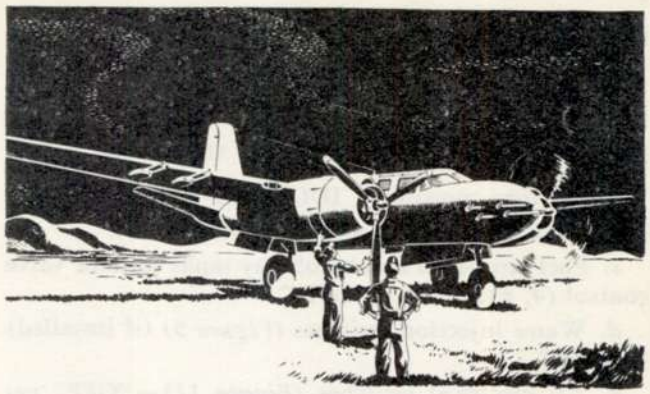
(1) Ignition switch check at 700 rpm.

(2) Cruising fuel-air mixture check at 1700 rpm.

(3) Engine power check at field barometric pressure.

(4) Ignition system check at 30 in. Hg. (max drop 65 rpm).

(5) Idle speed and mixture check. With throttles against the idle stop, the engines should idle at 600 rpm. When engine speed is stabilized, move the mixture control slowly with a smooth movement toward "IDLE CUT-OFF" and carefully observe the manifold pressure gage for any change in manifold pressure during this leaning procedure. When engine speed has dropped to 300 rpm during the leaning procedure, return the mixture control to "AUTO RICH." While leaning out the mixture with the mixture control, a decrease of more than ¼-inch manifold pressure during the leaning out indicates an excessively rich mixture. An immediate increase in manifold pressure not preceded by a momentary decrease in manifold pressure indicates that idle mixture is too lean.



19. STOPPING ENGINES.

a. STOPPING ENGINES DURING WARM WEATHER.

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

(2) 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) Battery switch – "OFF."

(3) 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 5.*c.* (14) of this section explains check of the right engine hydraulic pump after starting the engine. Paragraph (2) 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.

(4) Stop the left engine in a manner similar to that for stopping the right engine. Turn off all switches

except generator 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 – "BOTH ON."

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" except generator switches.

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" or "OFF."

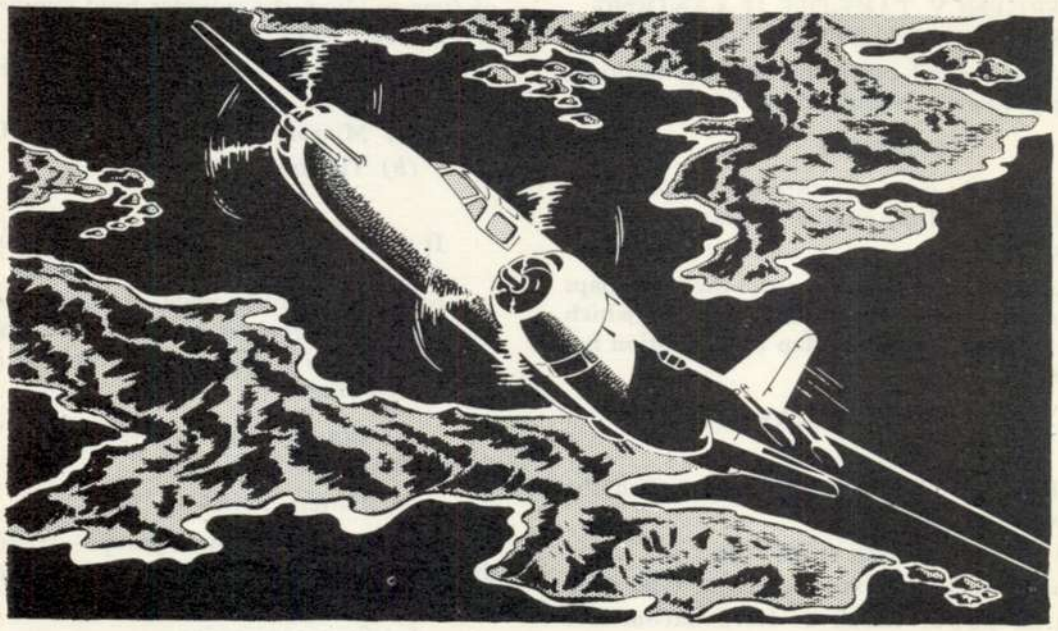
j. Aileron, elevator, and rudder trim tab controls – Set at "0" degrees.

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

l. Chocks – Check in place.

m. Parking brake control lever – Release.

n. Throttle lever lock control *(12, figure 17)* – Locked position.



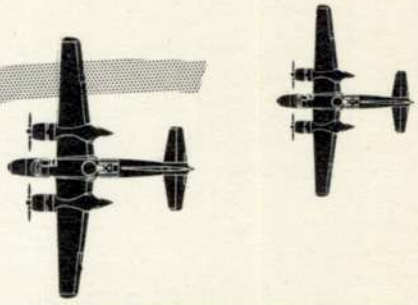
SECTION III
FLIGHT OPERATION DATA

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

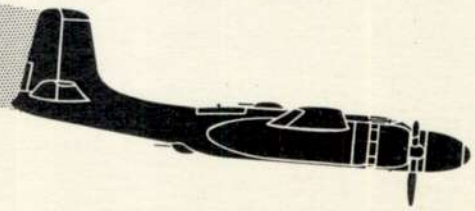
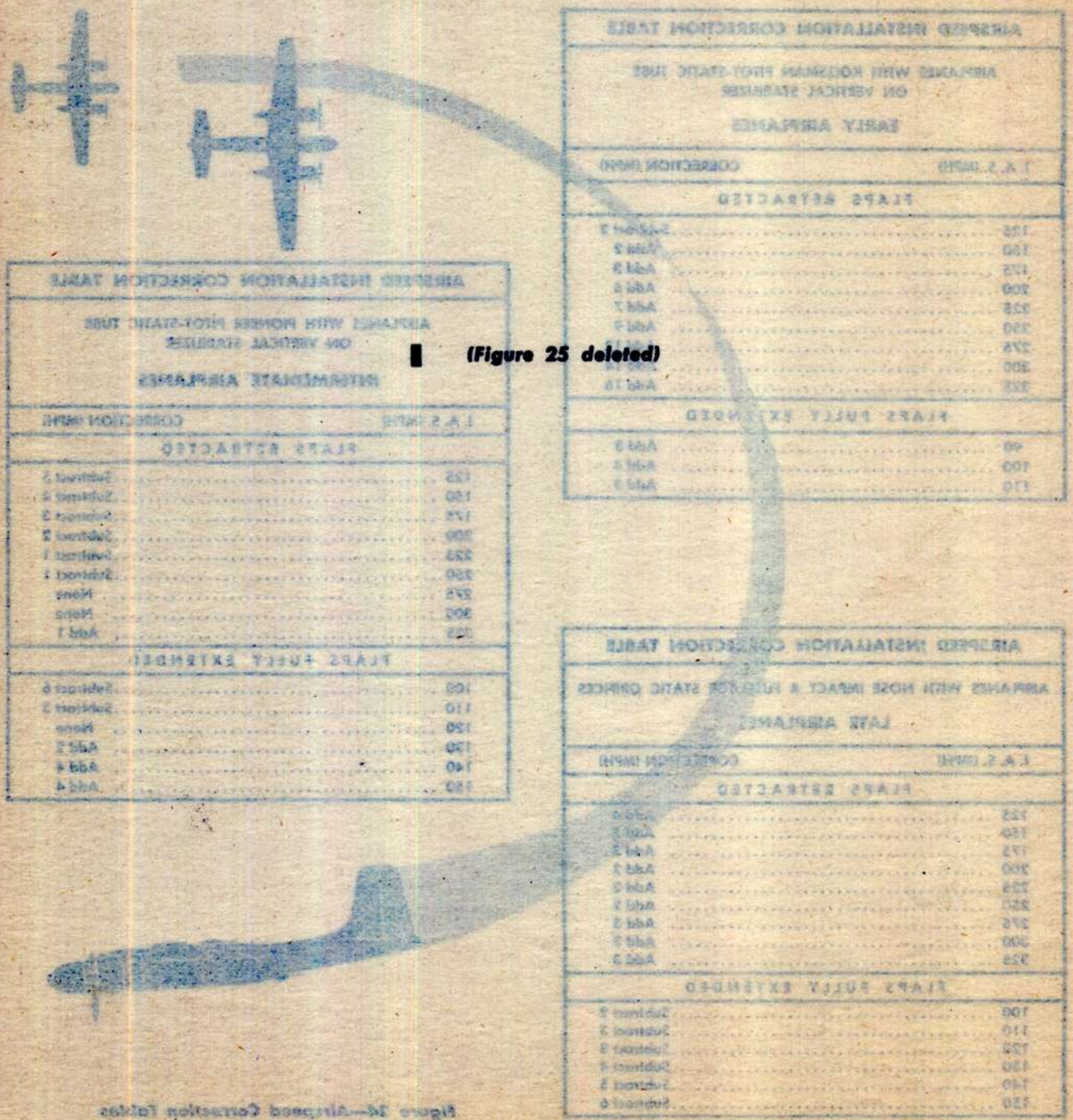


Figure 24—Airspeed Correction Tables

SECTION III
FLIGHT OPERATION DATA



(Figure 25 deleted)

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.

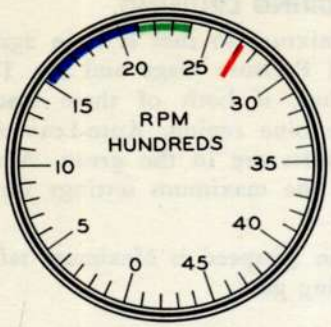
e. To aid in coordinating instruments with mixture, the Auto-Lean position on the Mixture Control Quadrant is painted blue and the Auto-Rich is green.

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.

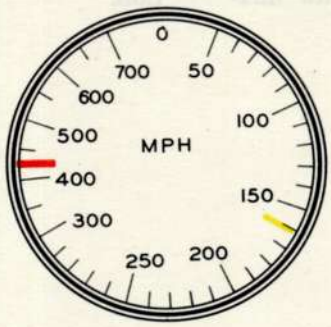
b. Yellow line on Airspeed is Maximum safe speed for extending landing gear.

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



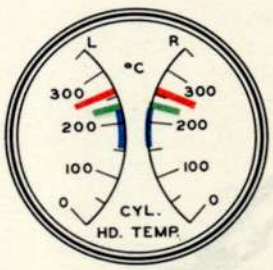
MIN CRUISE	1500
A.L. PERMITTED	1500-2100
A.R. REQUIRED	2100-2400
MAX CONTINUOUS (OPERATION ABOVE THIS POINT LIMITED)	2400
TAKE-OFF, MILITARY AND WAR EMERGENCY POWER	2700

MIN CRUISE	23"HG
A.L. PERMITTED	23"-33"HG
A.R. REQUIRED	33"-42"HG
MAX CONTINUOUS (OPERATION ABOVE THIS POINT LIMITED)	42"HG
TAKE-OFF & MILITARY POWER DRY -5 MIN	52"HG
WAR EMERGENCY POWER WET -15 MIN	58"HG



MAX PERMISSIBLE IAS LANDING GEAR EXTENSION (208 MPH FLAP EXT.)	160 MPH
MAX PERMISSIBLE IAS DIVING	425 MPH

CAUTION-POSSIBLE ICING	-10° TO +15°C
OPERATING RANGE	+15° TO 32°C
DANGER-DETONATION	38°C



A.L. PERMITTED	150°-232°C
MAX CONTINUOUS A.L. OR A.R. PERMITTED	232°C
5 MIN LIMIT A.R. REQUIRED	260°C

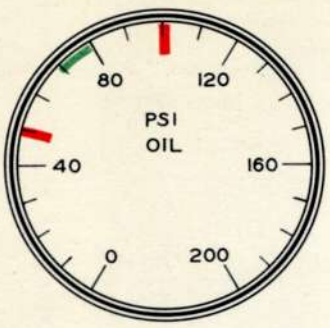
FUEL GRADE 100/130

MINIMUM FOR FLIGHT	17 PSI
OPERATING RANGE	17-19 PSI
MAXIMUM	21 PSI

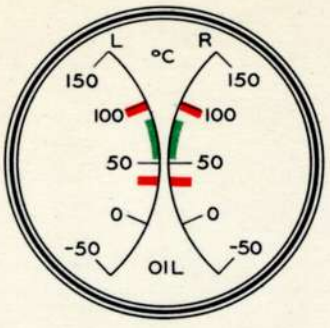
AIRPLANES WITH WATER INJECTION

MINIMUM FOR FLIGHT	22 PSI
OPERATING RANGE	22-24 PSI
MAXIMUM	26 PSI

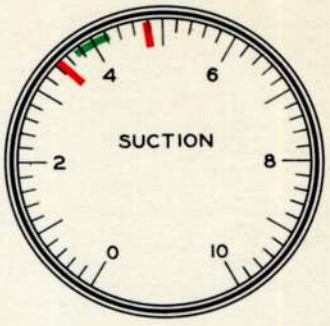
Figure 26—Instrument Range Markings (Sheet 1 of 2)



MINIMUM FOR FLIGHT 50 PSI
OPERATING RANGE 70-80 PSI
MAXIMUM 100 PSI

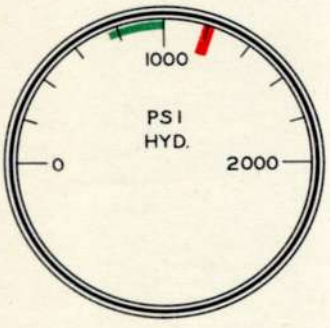


MINIMUM FOR FLIGHT 40°C
OPERATING RANGE 60°-85°C
MAXIMUM 100°C

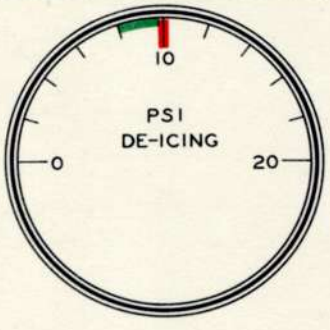


MINIMUM 3.5"HG
OPERATING RANGE 3.75"-4.25"HG
MAXIMUM 4.75"HG

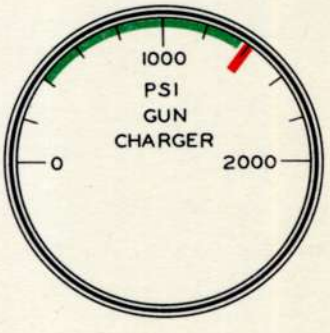
FUEL GRADE 100/130



OPERATING RANGE 750-1000 PSI
MAXIMUM 1200 PSI

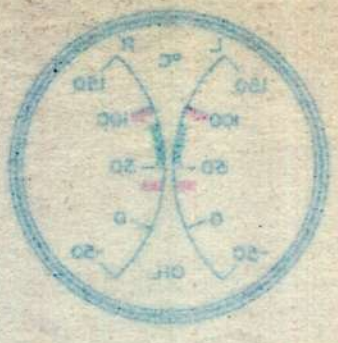


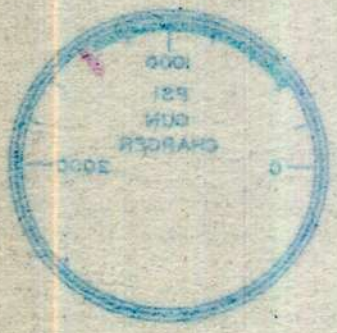
OPERATING RANGE 8-10 PSI
MAXIMUM 10 PSI



OPERATING RANGE 400-1375 PSI
MAXIMUM 1400 PSI

Figure 26—Instrument Range Markings (Sheet 2 of 2)





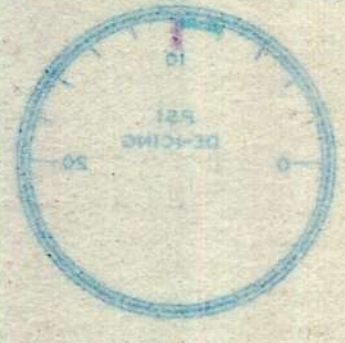
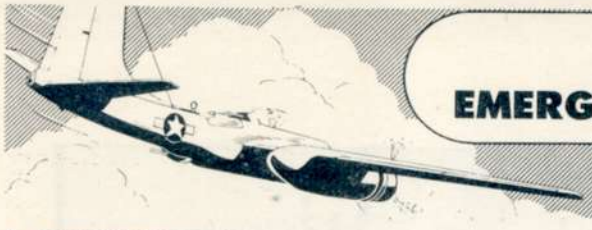


Figure 2a—Instrument Range Markings (Sheet 2 of 2)



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) Sound three short rings on the alarm bell *(22, figure 28)*.

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

(4) Make sure you have sufficient altitude for a safe bail-out. Slow airplane down to the lowest airspeed to maintain straight and level flight.

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

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

(7) Call bombardier to "bail out" (if he is going to use nose entrance hatch, in order to preclude injury from open bomb bay doors).

(8) Open bomb bay doors and salvo bombs.

(9) Slide seat back.

(10) Call gunner to "bail out."

(11) Sound one long ring on the alarm bell.

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

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

(14) To bail-out from the front cockpit, in level flight, dive (or jump head first) out and back toward the upper surface of the wing as though aiming at a point about halfway back on the wing and halfway out to the nacelle. Lowering the wing flaps 10 to 20 degrees, and thereby raising the tail, will give additional clearance for missing the tail surfaces. Jumping directly out from the cockpit toward the nacelle may be used as an alternate procedure. However, due to the increased drag on the body when it is normal to the air stream, there is a tendency to blow back rather than drop down after passing the wing. Lowering the flaps 10 to 20 degrees should make this procedure quite safe at speeds up to 200 mph. *(See figure 27.)*

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) Propeller—Feather.

(2) Mixture control—"IDLE CUT-OFF."

(3) Fuel tank selector valve—"BOTH OFF."

(4) Fuel cross-feed and bomb bay tank selector valve control "OFF," or to unaffected engine.

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

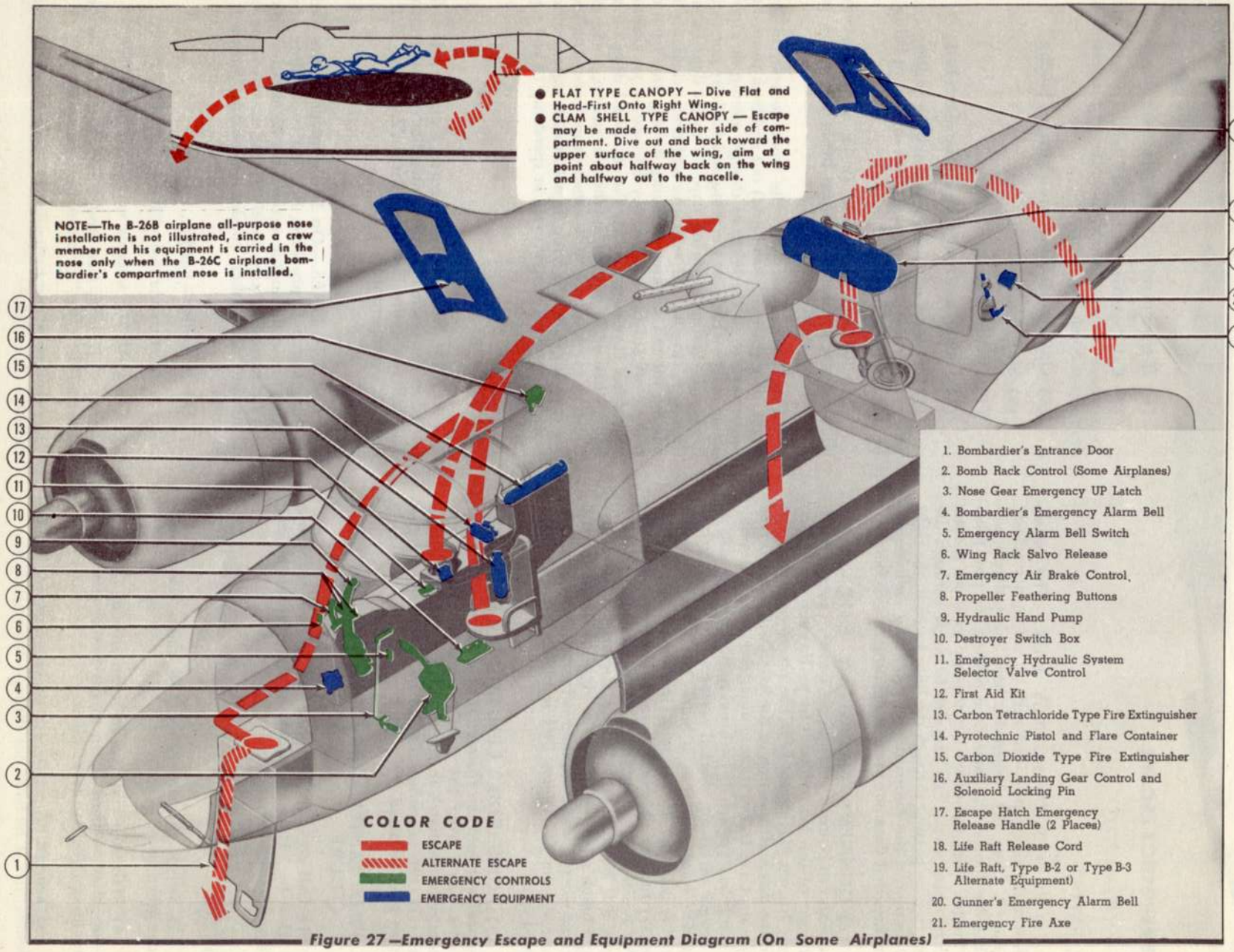
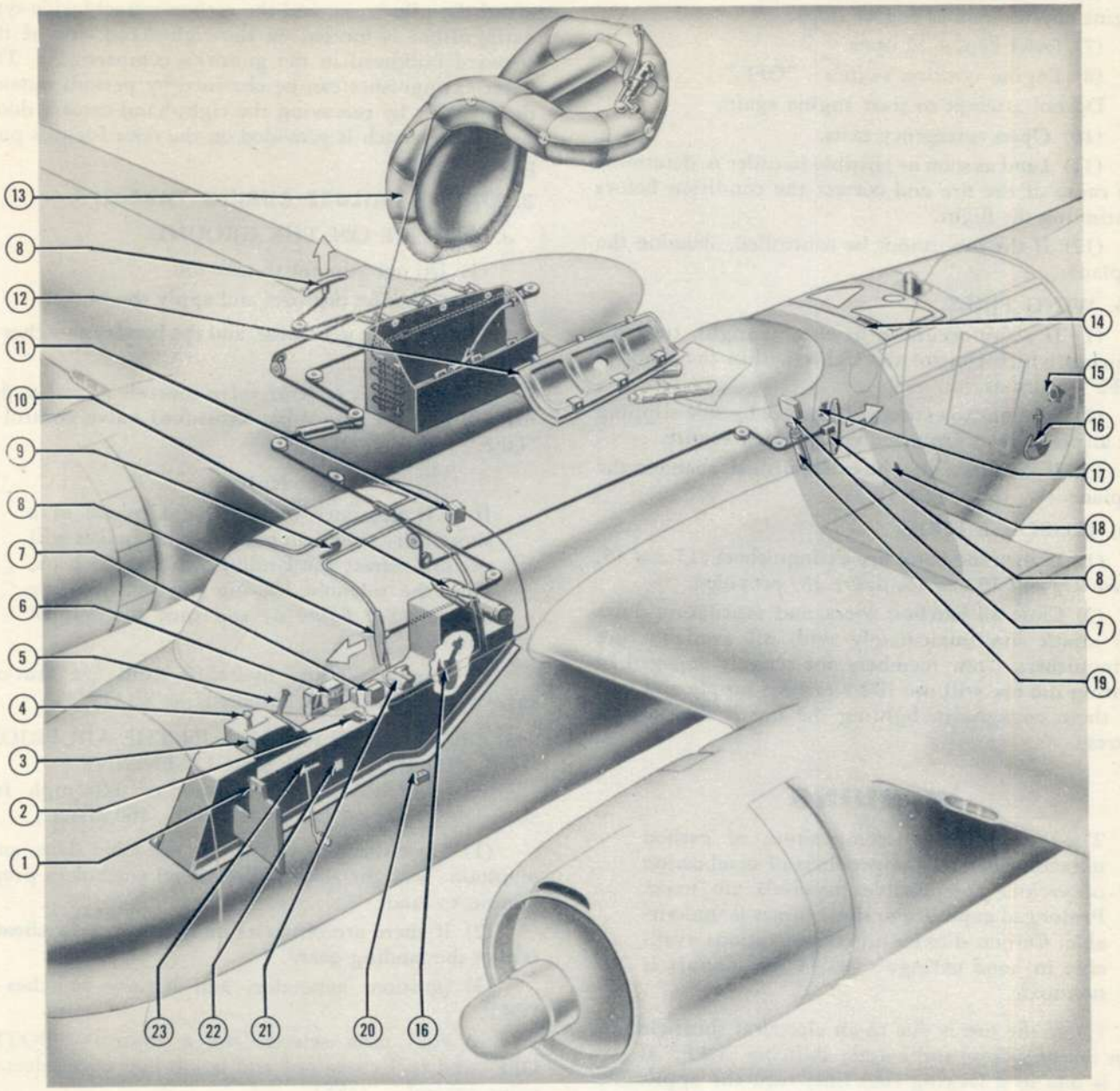


Figure 27—Emergency Escape and Equipment Diagram (On Some Airplanes)



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)

(6) Release carbon dioxide charge (if installed) to engine afire as soon as engine stops.

(7) Cowl flaps – ¼ open.

(8) Engine ignition switch – "OFF."

Do not attempt to start 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 hatches, doors, and ventilating ducts and attack fire immediately with all available fire extinguishers. Crew members not actively engaged in fighting the fire will use 100% oxygen supply and will aid those engaged in fighting the fire if they are in distress.

WARNING

The products of decomposition of carbon tetrachloride and the products of combustion of various combustible materials are toxic. Prolonged exposure to these fumes is undesirable. Carbon dioxide in concentrations available in hand extinguishers in the aircraft is non-toxic.

(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) After the fire is extinguished, to dissipate smoke and/or fumes from the fuselage, open *only* the following:

(a) Bomb bay access door (pilot's compartment.

(b) Bomb bay doors.

(c) Open right hand pilot's enclosure ventilating window.

(5) 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. One 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 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 the 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 lb., 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 control – "BOTH OFF" and fuel cross-feed and bomb bay tank selector 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) Rudder 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 Flight Operations Instructions Charts in Appendix I.

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

Gross Weight (Lb.)	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) Fuel cross-feed and bomb bay tank selector 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)* – "BOTH 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 unfeather the propeller and re-start the inoperative engine proceed with instructions outlined in Paragraph 3A, this section.

(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 below.

d. 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) Landing gear should be extended at the pilot's discretion.

Note

With only one engine-driven hydraulic pump operative, a longer period of time is required to extend the landing gear. Have the crew stand by to release landing gear up latches and to operate the hydraulic hand pump if necessary.

(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 are maintained. A normal pattern and approach angle should be flown, with the only variation being in the final approach speed required, until final commitment for landing is made.

(2) FINAL APPROACH.

(a) Flaps should be used at maximum efficiency position and not lowered full down until landing is assured, i.e., just before round out.

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

e. SINGLE ENGINE GO-AROUND. – During single engine approach, make the decision to go around before lowering full flaps and decreasing airspeed below 140 mph.

(1) Apply power smoothly and steadily to the operative engine.

(2) Retract the gear. If flaps are down lower than take-off setting (20°) raise to 20°.

(3) Retrim flight controls.

(4) Maintain a minimum airspeed of 140 mph.

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

3A. UNFEATHERING PROCEDURE.

a. Propeller control – "DECREASE RPM."

b. Throttle – ¼ open.

c. Feathering button – Push in and hold until 1000 rpm is reached, then pull out.

d. Ignition switch – "BOTH" after propeller has turned at least three revolutions.

e. Fuel selector valve – On desired tank.

f. Fuel booster pump – "LOW BOOST."

g. Mixture control – "AUTO-RICH" after fuel pressure is attained.

h. Generator switch – "ON" at 1000 rpm (release feathering button).

i. Cowl flaps – As required.

j. Warm up engine at low rpm.

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 Flight Operation Instruction Charts – Appendix I.

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.)

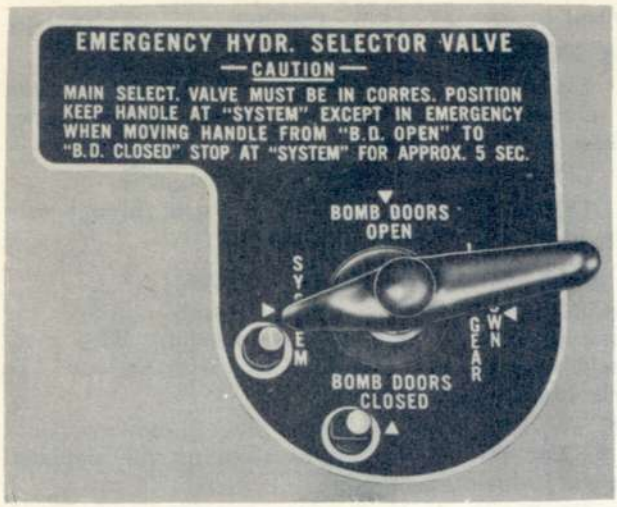


Figure 29—Emergency Hydraulic Selector Valve Control

(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 handcrank, 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 flap's position indicator is installed adjacent to this handcrank.

8. LANDING GEAR EMERGENCY OPERATION.

a. MAIN LANDING GEAR.—The failure of the landing gear to come down may be caused by malfunction of the main landing gear uplatch or hydraulic system failure. The following procedure will provide means of extending the gear in either case.

(1) Check the position light bulbs, circuit breaker and hydraulic pressure within limits.

(2) Landing gear control lever—"UP."

(3) Check to see that the auxiliary landing gear control positions synchronously and properly with the landing gear control lever. If the landing gear lever is malfunctioning the auxiliary landing gear control can be used to operate the landing gear.

(4) Pull the emergency uplatch handles. Holding handles in extended position, place landing gear control lever—"DOWN." If gear extends release handle.

(5) If gear fails to extend place emergency hydraulic selector valve control—"LANDING GEAR DOWN."

(6) Actuate the hydraulic hand pump.

(7) As gear extends release the uplatch handles.

(8) Make sure the landing gear is extended and locked, check position indicator and also visually check.

(9) Make final check for pressure with hand pump before landing. This may not show on pressure gage.

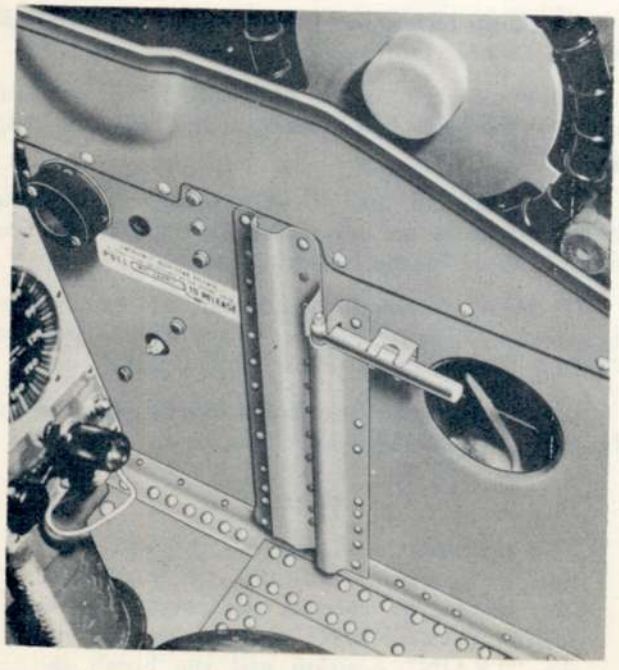


Figure 30—Nose Wheel Emergency Release Lever

(10) Move the emergency hydraulic selector valve control to the "SYSTEM" position.

b. NOSE GEAR.

(1) In case the nose wheel fails to extend it can be mechanically released by pulling the emergency release control. Proceed as outlined in 8*a*.

(2) Turn on nose gear inspection lamp.

(3) Observe nose gear actuating strut through window in floor to see that it is straight.

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) Sound six short rings on the alarm bell.

(c) Switch on emergency IFF radio transmitter.

(d) Remove parachute.

(e) Tighten safety belt and lock shoulder harness.

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

(g) Salvo bombs and close bomb bay doors.

CAUTION

Bomb bay doors must be closed.

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

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

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

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

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

(m) 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) Call crew—"Brace"—sound one long sustained ring on the alarm bell.

(d) 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.

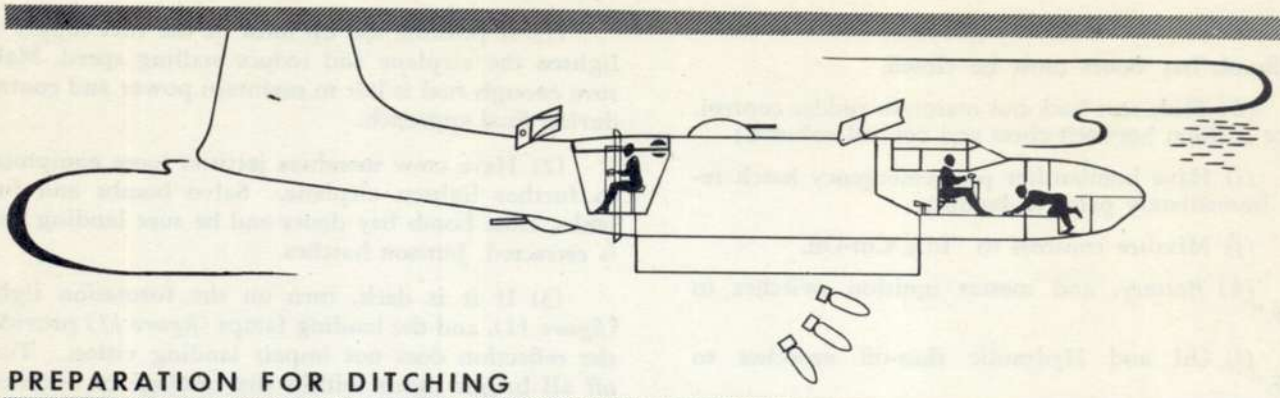
(1) APPROACH.—Use from 25 degree to 38 degree flaps and make a normal approach to insure control and permit some margin of speed after leveling off. Power should be used, if available, so that the best point for ditching on a swell may be chosen. Make the approach and ditch parallel to the swells, preferably 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.

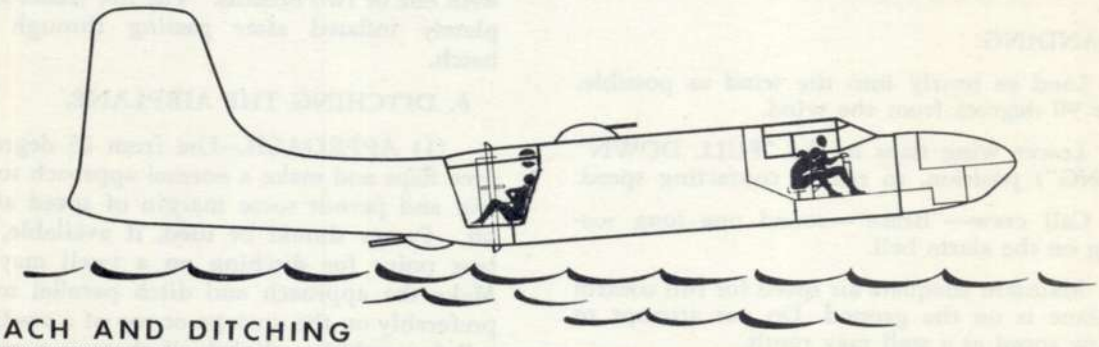
c. IMMEDIATELY AFTER DITCHING.

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

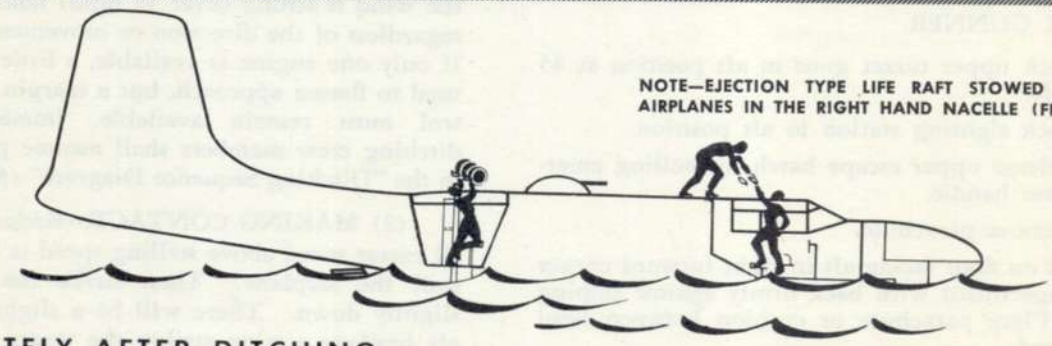
(2) The gunner shall remove the life raft from stowage by pulling the life raft emergency release cord, then hoist the raft out of the gunner's compartment, then exit through the upper emergency escape hatch. Later airplanes are equipped with a self ejecting, self inflating life raft *(figure 28)* in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



PREPARATION FOR DITCHING

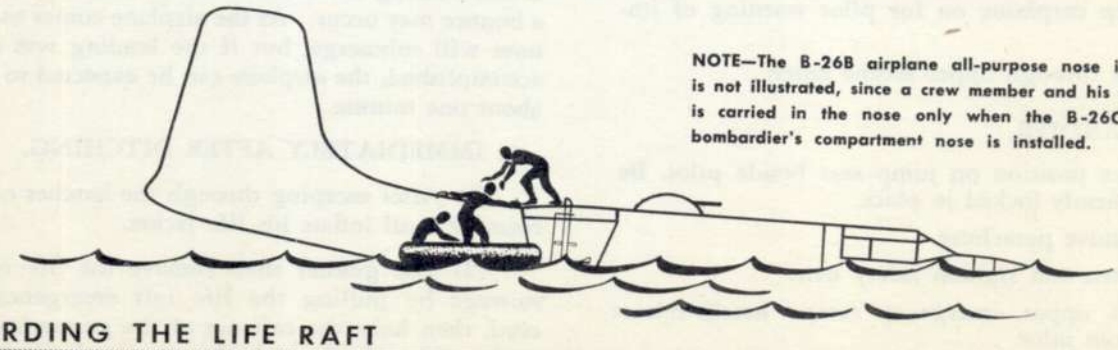


APPROACH AND DITCHING



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

IMMEDIATELY AFTER DITCHING



NOTE—The B-26B airplane all-purpose nose installation is not illustrated, since a crew member and his equipment is carried in the nose only when the B-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) Sound six short rings on the alarm bell.

(c) Switch on emergency IFF radio transmitter.

(d) Unbuckle parachute.

(e) Tighten safety belt and shoulder harness.

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

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

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

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

(j) Sound one long sustained ring on the alarm bell.

(k) 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.

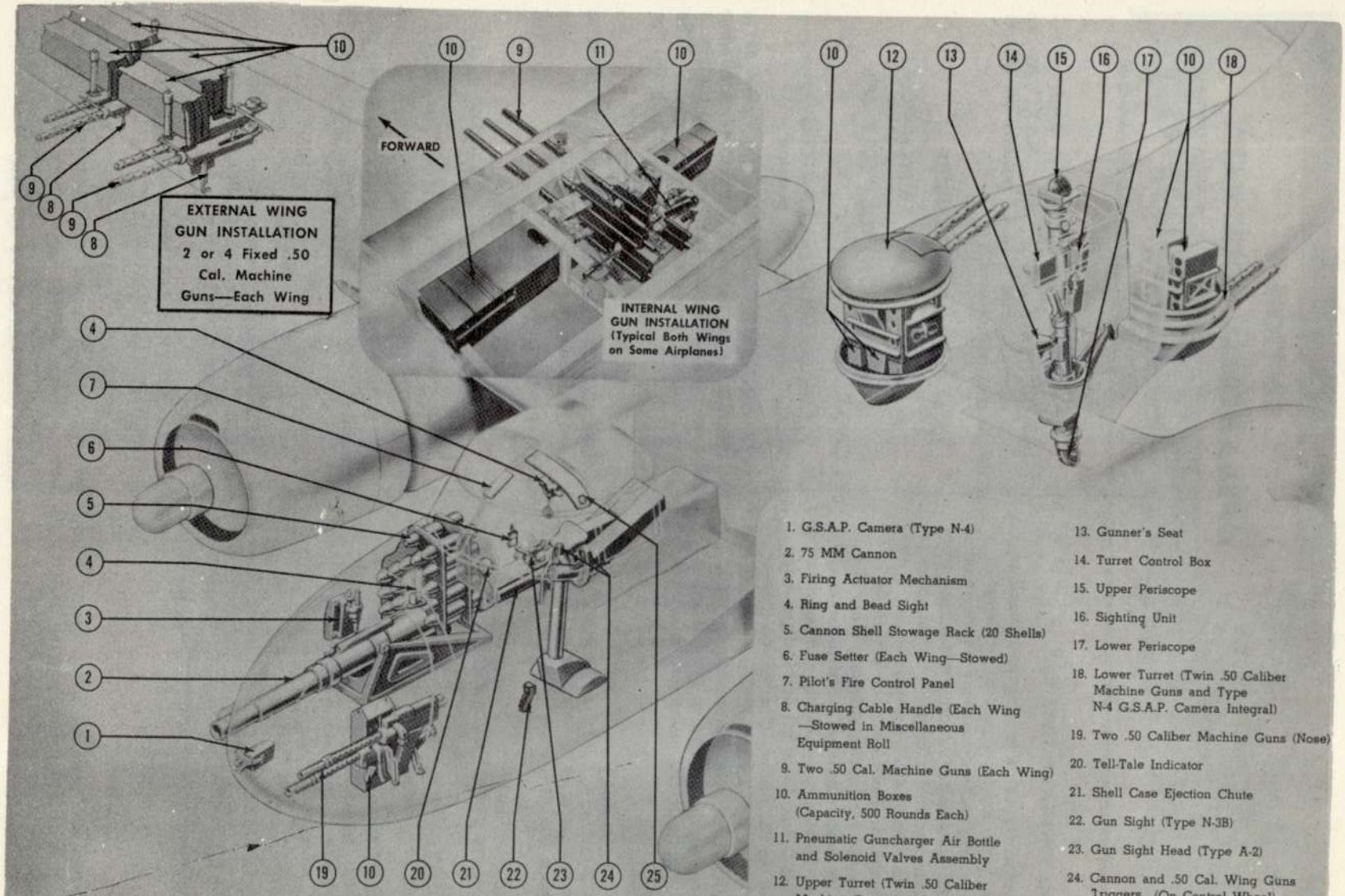


Figure 32 — Gunnery Equipment Diagram (On Some Airplanes)

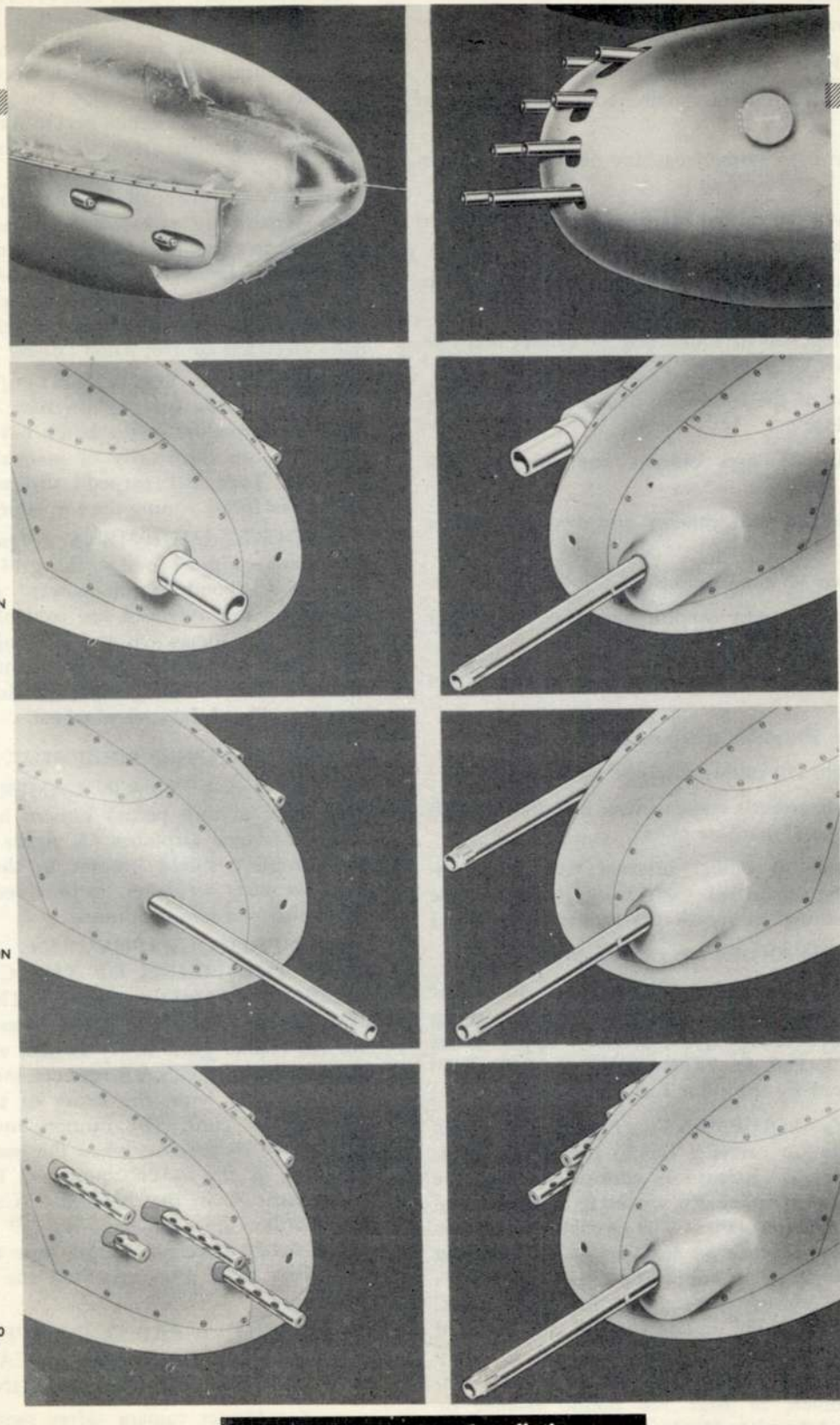


Figure 33 —Nose Installations

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 33)*:

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 B-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. Some airplanes have been modified to carry fragmentation bombs.

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. Some airplanes have been modified to carry M33A1 chemical tanks at station 7 in the forward bomb bay or station 6A in the rear bomb bay. The chemical release switches are located either on the auxiliary electrical control panel *(figure 8)*, or the main electrical control panel *(figure 9)*.

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 of 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.

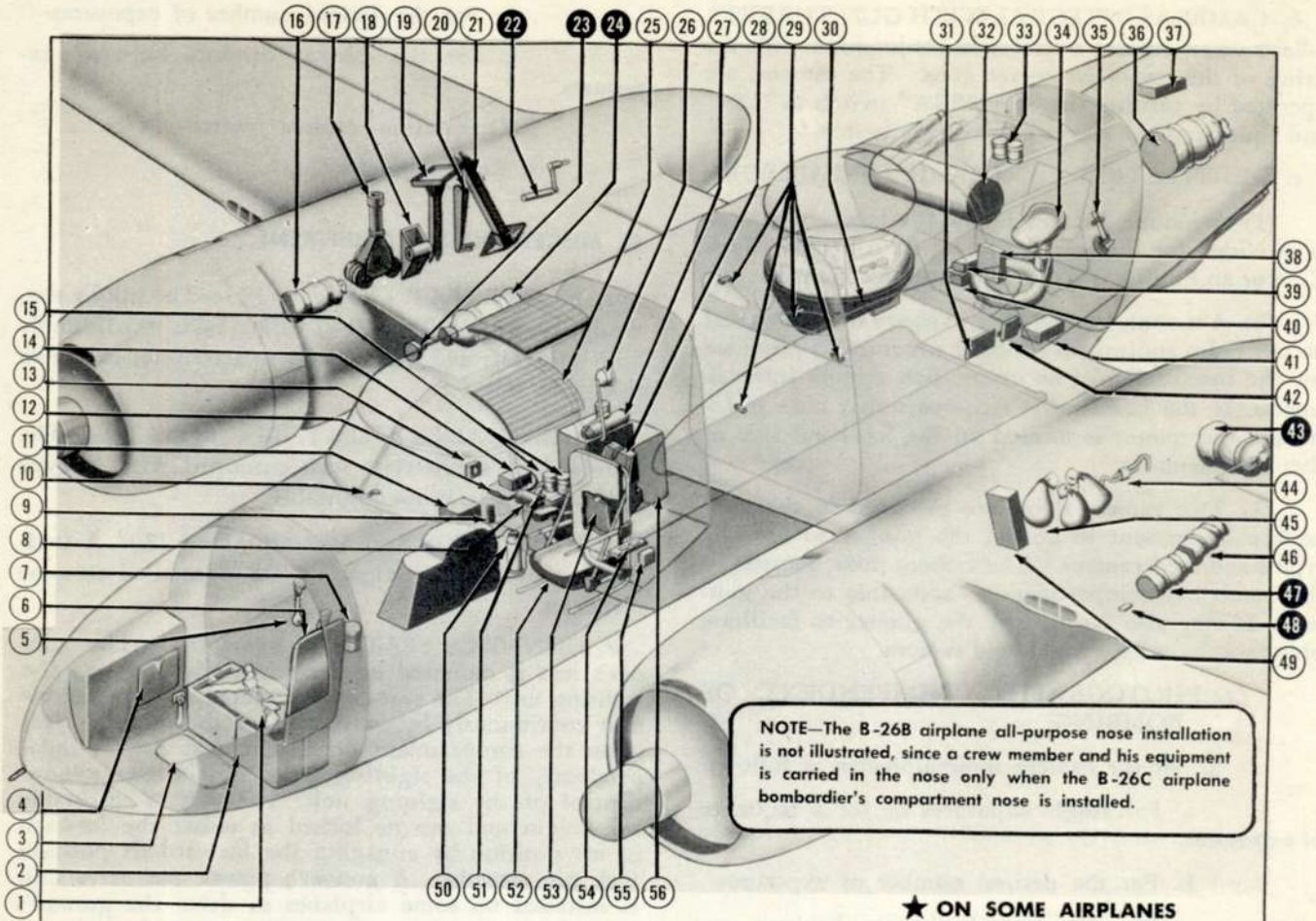
e. ADDITIONAL EQUIPMENT.—Refer to the "MISCELLANEOUS EQUIPMENT" diagram *(figure 35)* for additional equipment.

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) RADIO SET AN/ARC-3.—This radio set is a multi-channel receiving and transmitting set designed to provide plane-to-plane or plane-to-ground voice communication at distances of 30 miles at 1000-foot altitude to 135 miles at 10,000-foot altitude.

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

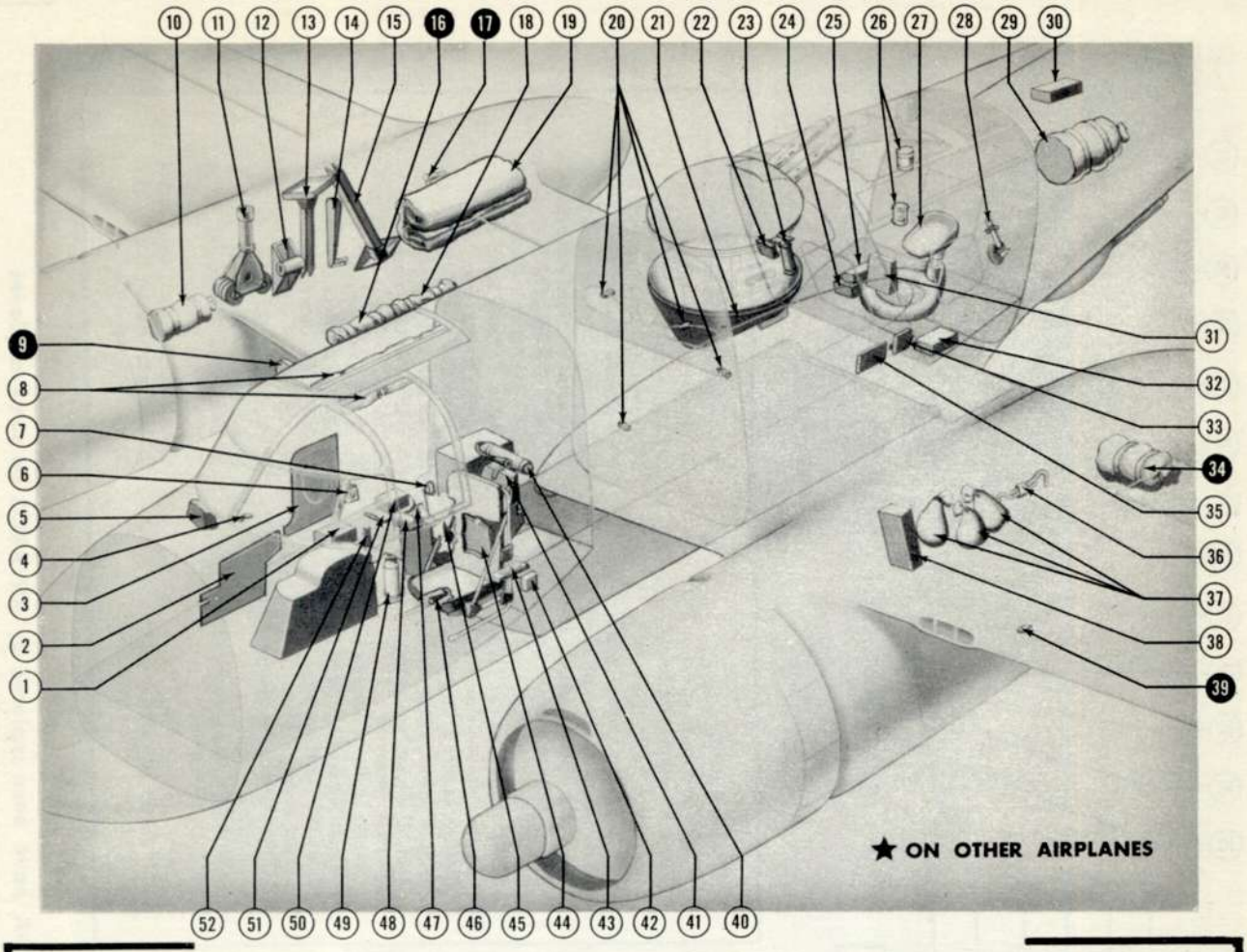


NOTE—The B-26B airplane all-purpose nose installation is not illustrated, since a crew member and his equipment is carried in the nose only when the B-26C airplane bombardier's compartment nose is installed.

★ ON SOME AIRPLANES

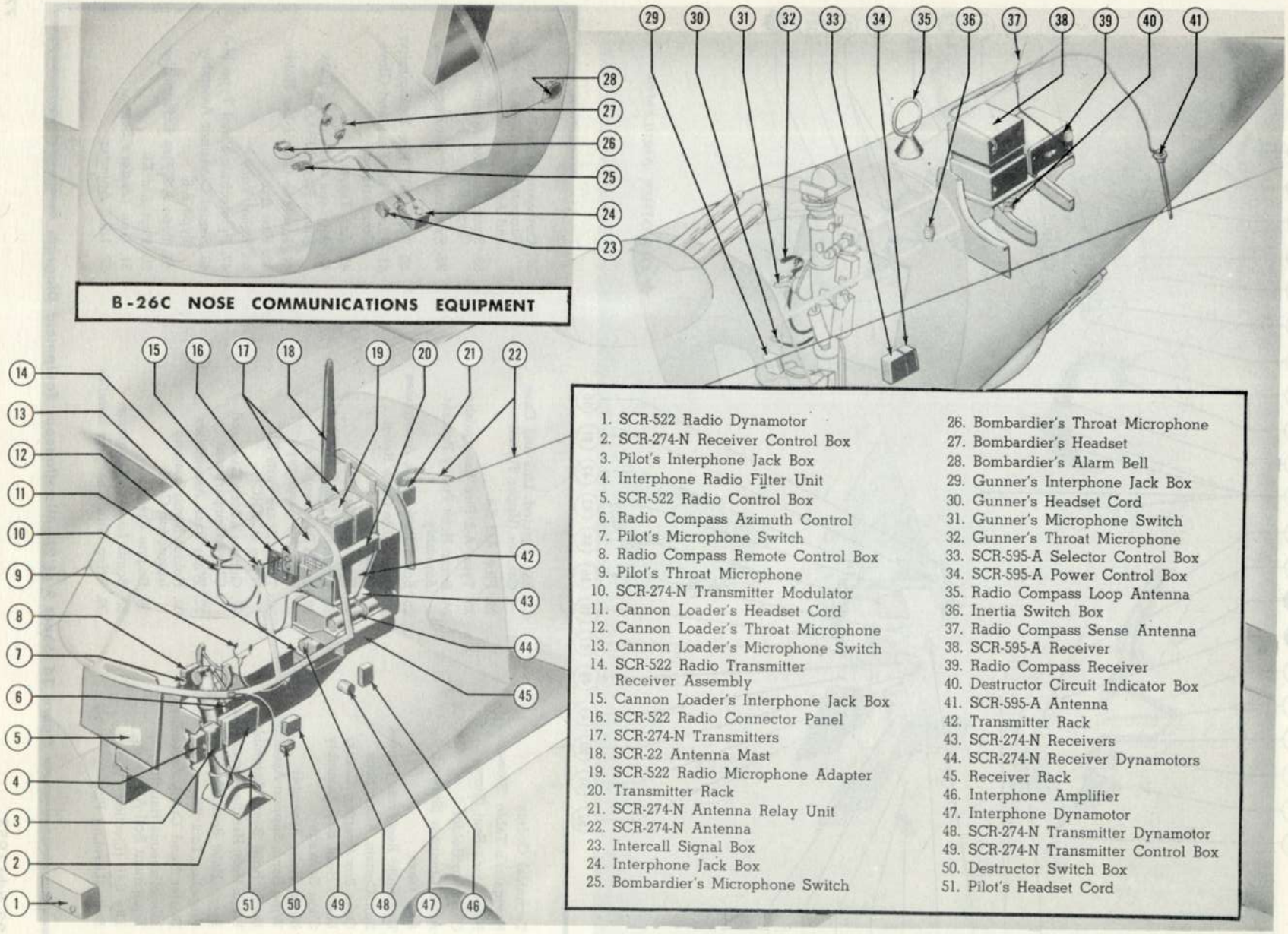
1. Seat and Safety Belt (On Top of Ammunition Box)
2. Four Ammunition Boxes
3. Kneeling Pad
4. Data Case Holder
5. Entrance Assist Straps
6. Chart Board
7. Relief Container
8. Signal Container Assembly Type A-6
9. Load Adjuster
10. Clip Map Holder
11. Technical Orders
12. Gun Loader's Seat
13. Ash Trays
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



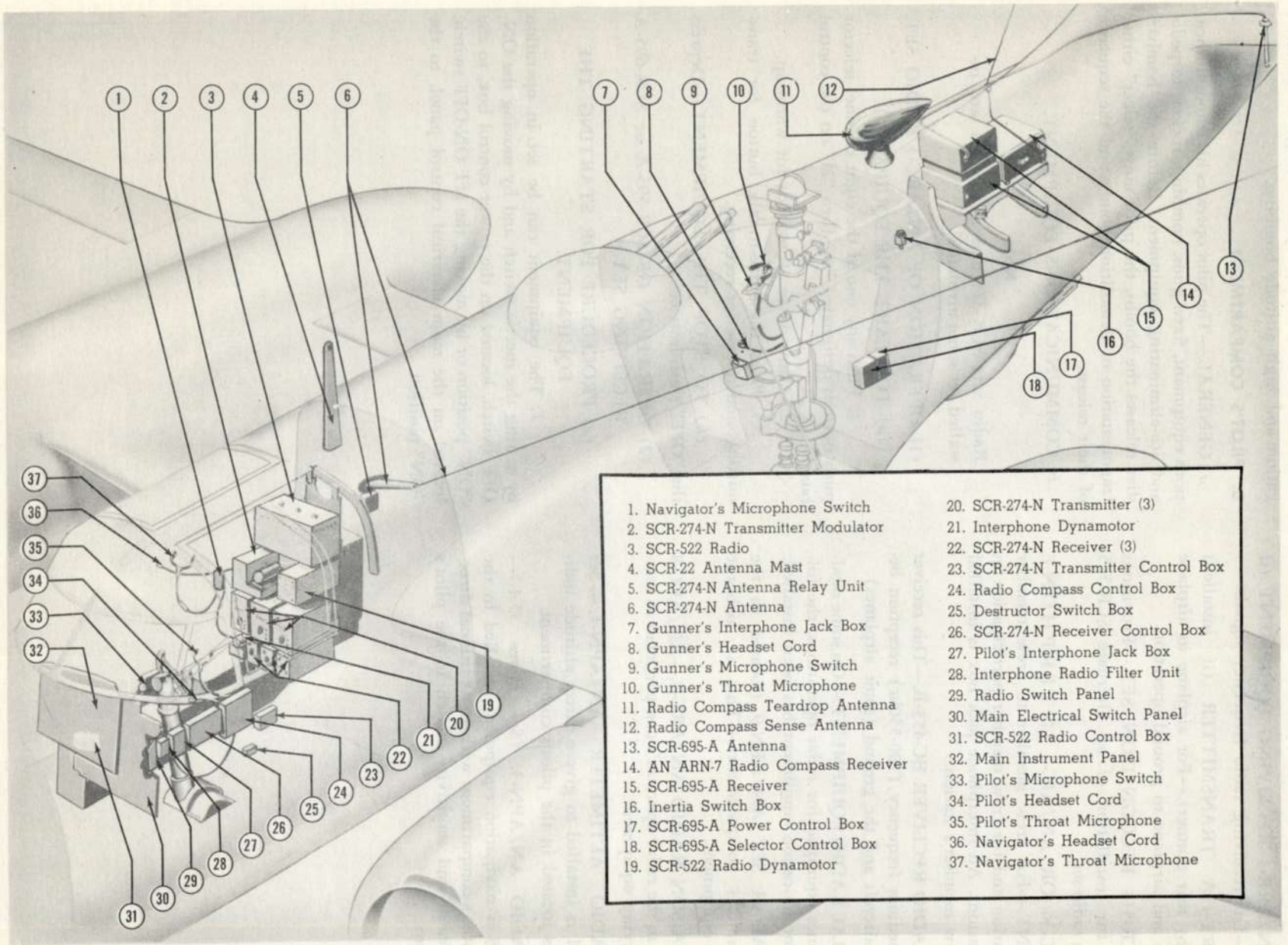
1. Technical Orders
2. Navigator's Table (Stowed)
3. Navigator's Seat (Stowed)
4. Clip Map Holder
5. Astro Compass (Stowed)
6. Ash Trays
7. Hydraulic Reservoir Funnel
8. Sun Curtain Assemblies
9. Gear Box (Starting Crank)
10. Bomb Hoist Bag Assembly Sling Stowage
11. Bomb Hoist Assembly
12. Wing Bomb 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 Receptacle
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



Note: Radio sets SCR-274-N and SCR-522-A have been replaced by AN/ARC-3 on some airplanes.

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



Note: Radio sets SCR-274-N and SCR-522-A have been replaced by AN/ARC-3 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) ART-13A TRANSMITTER (if installed) (operated by rear gunner).—For airplane to airplane long range and airplane to ground operation.

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

(7) 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.

(8) RADIO RECEIVER BC-453-B.—This receiver provides medium frequency (190-550kc) reception between the aircraft and the ground (some airplanes).

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 commmunications 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.

Note

Radio sets SCR-274 and SCR-522-A are installed on some airplanes.

(1) OPERATION OF AN/ARC-3 RADIO SET.

(a) TO START THE EQUIPMENT.

1. Push any one of the eight channel selector push buttons designated "A" thru "H" on the control box.

2. Allow 30 to 40 seconds for warm-up.

3 Press the press-to-talk button for transmitting, and release for receiving.

(b) TO STOP THE EQUIPMENT.—Depress the "OFF" push button.

(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.

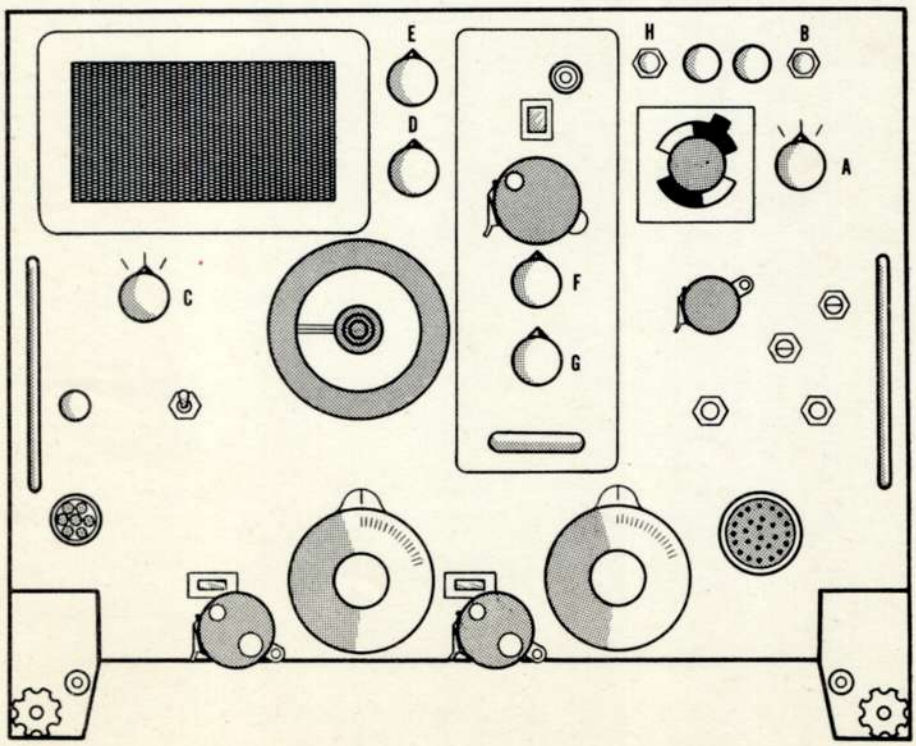


Figure 35A—AN/APN-3 Radio

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) 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.

(7) 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.

(8) RADIO-RECEIVER BC-453-B.—The receiver is placed in operation by placing the "CW-OFF-MCW" switch in either "CW" or "MCW" position.

(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

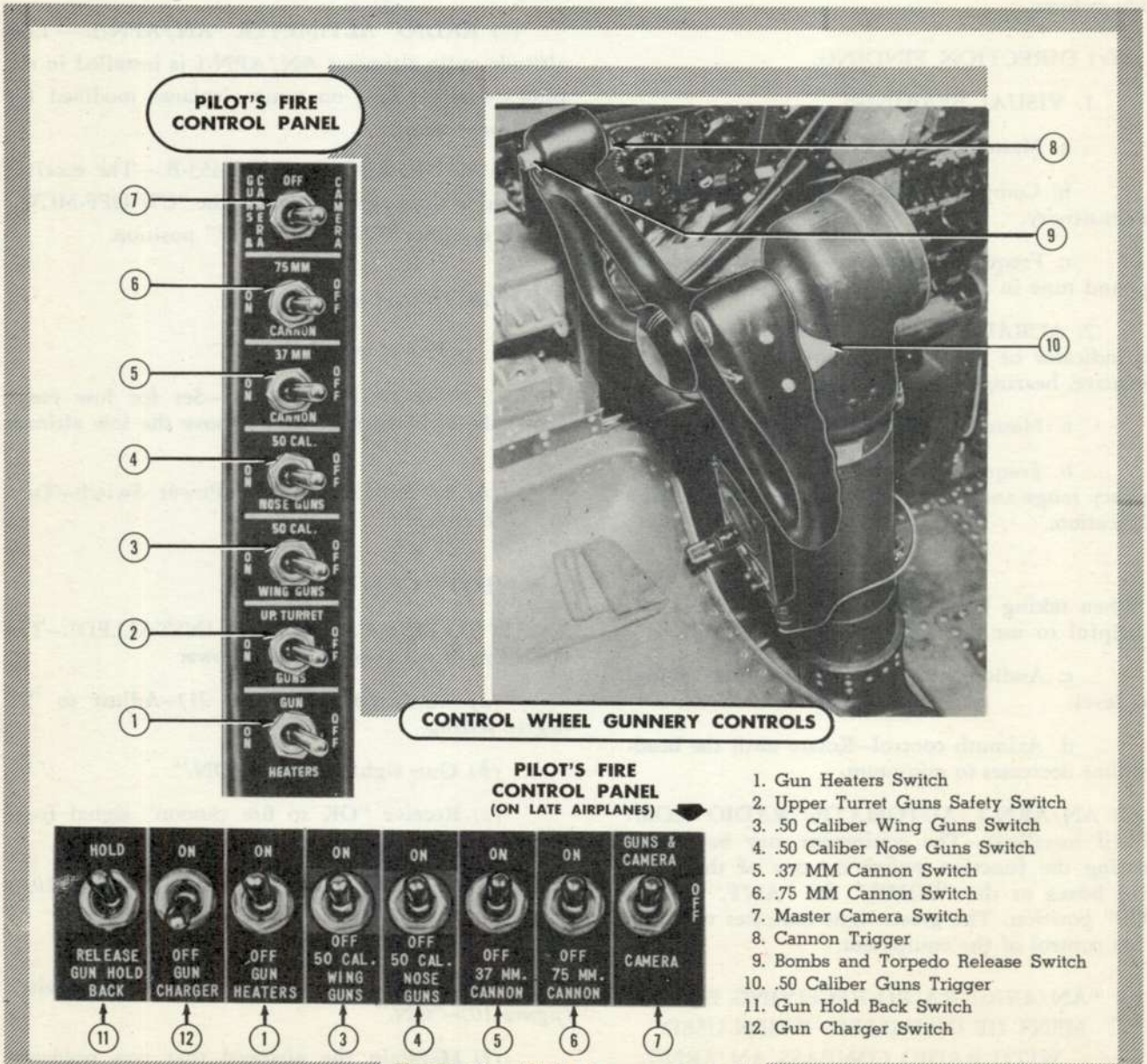
Do not hold switch down over 30 seconds.

(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

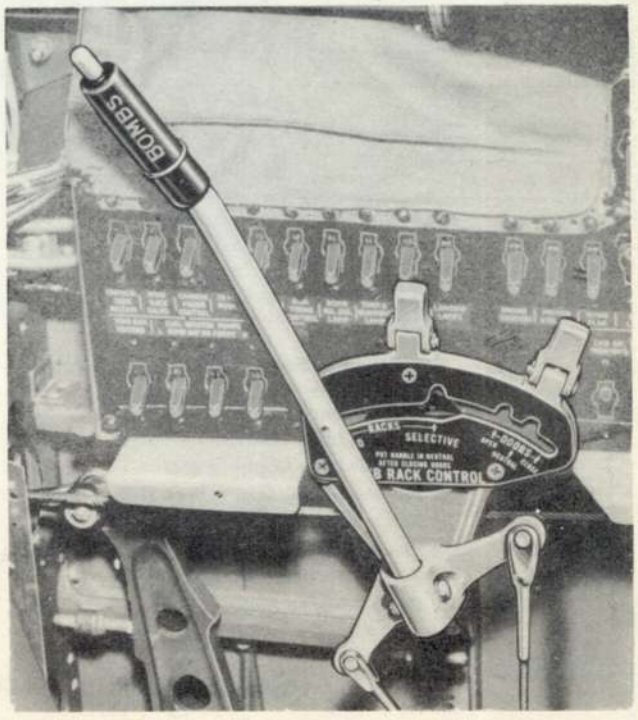
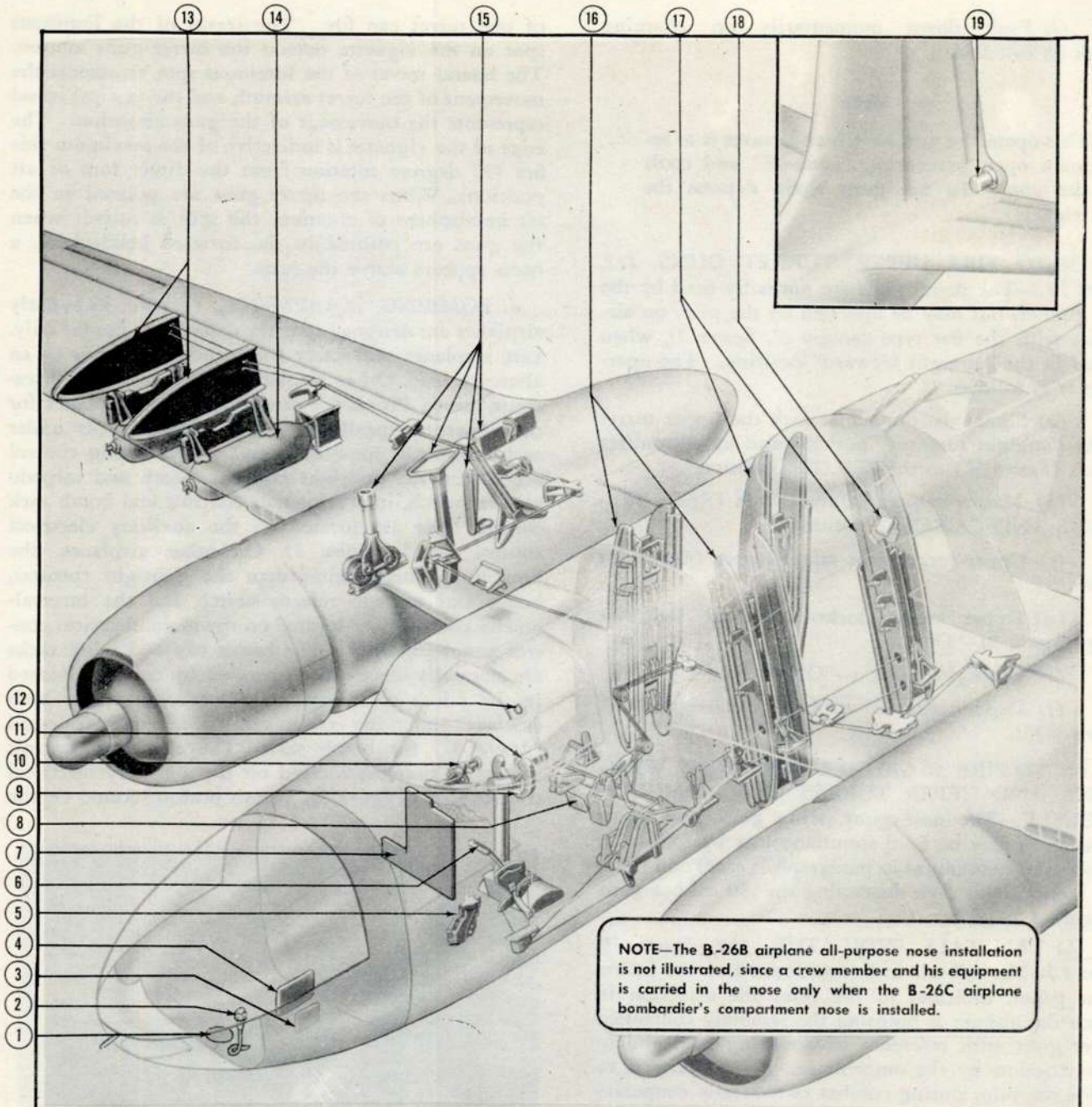


Figure 37—Bomb Rack Control (Early Airplanes)



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.

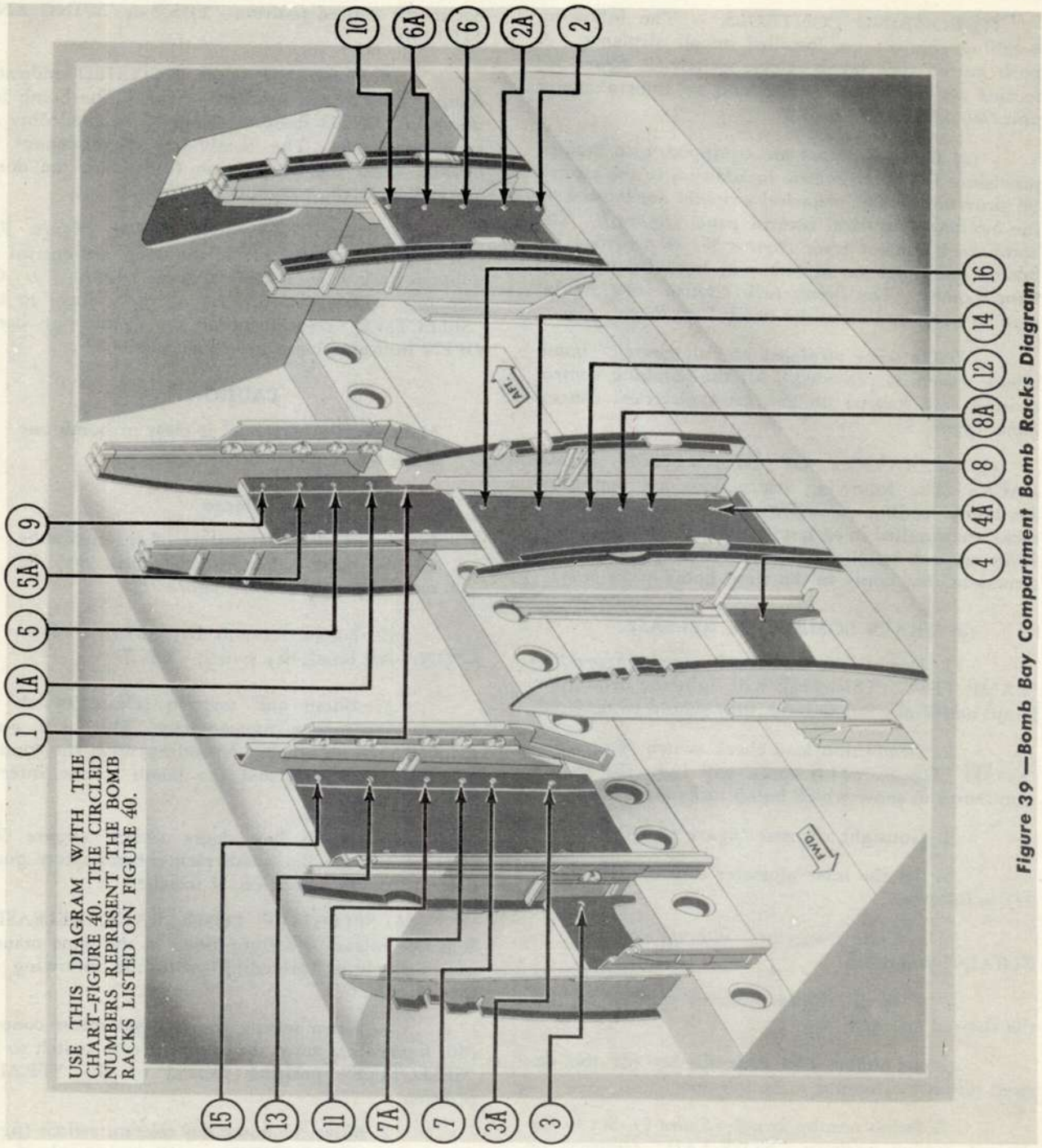


Figure 39 —Bomb Bay Compartment Bomb Racks Diagram

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-M58 A2 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) M47A 3 (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."

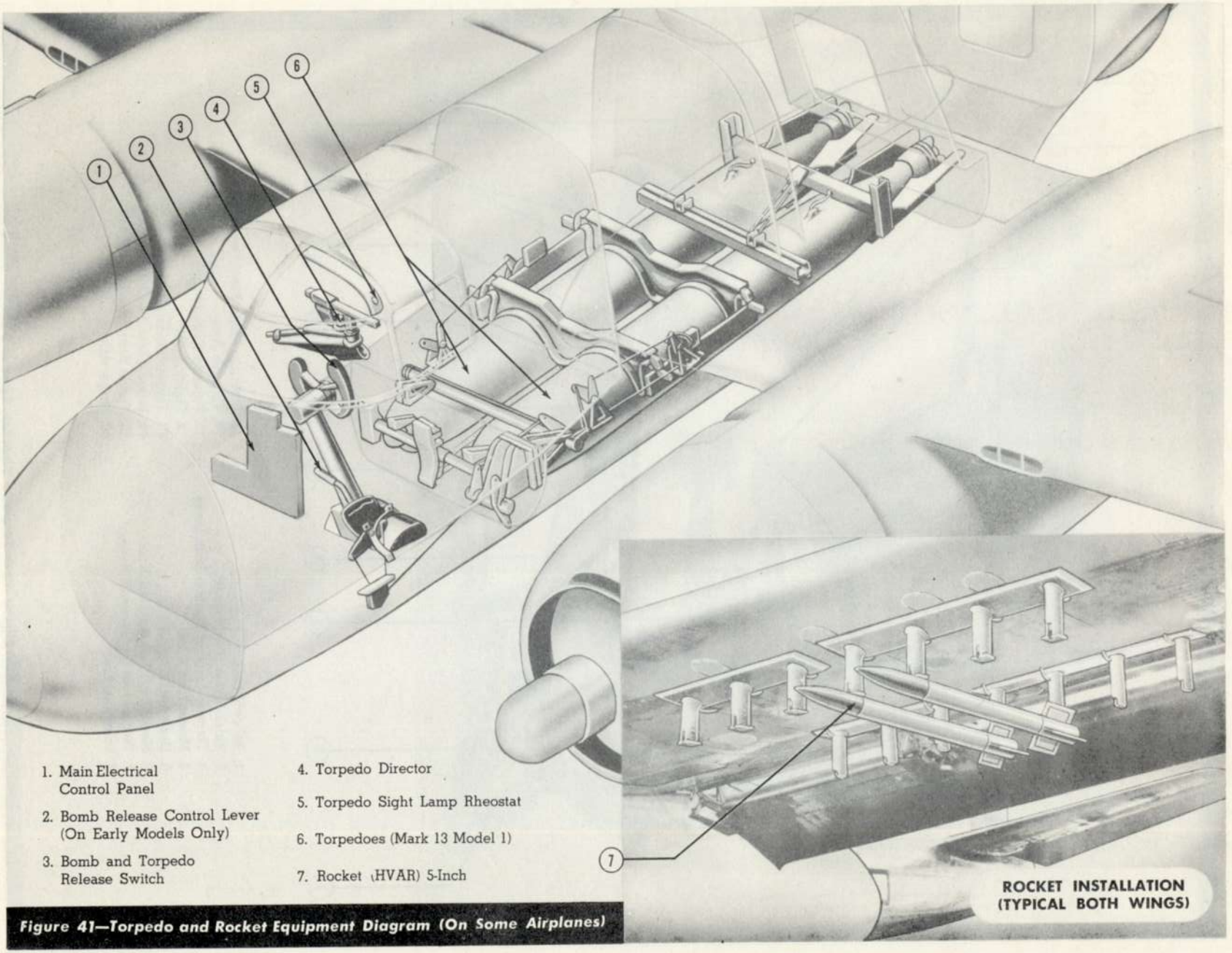
3. Bomb circuit main power switch *(figure 9)* —"ON."

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.

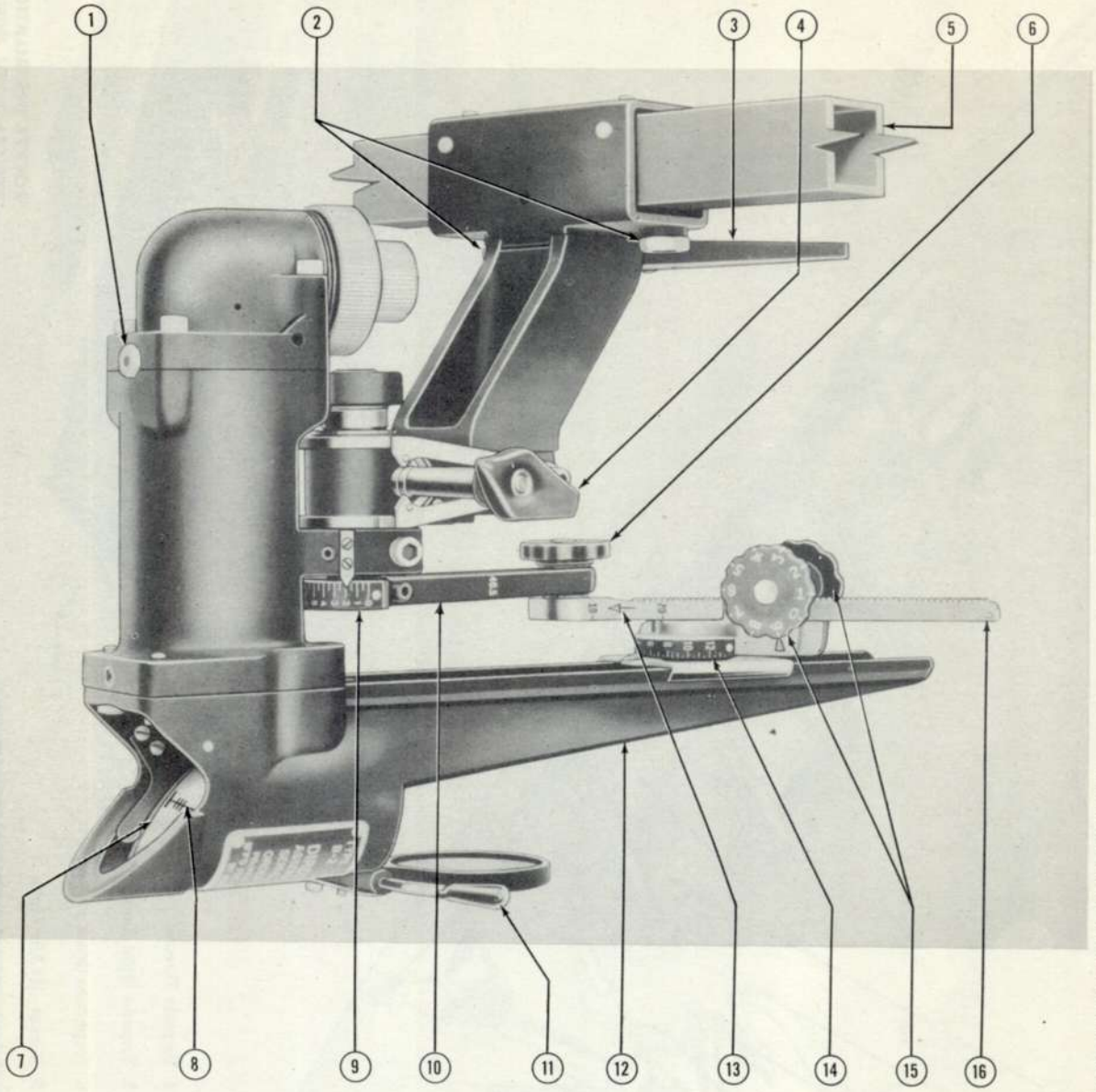
6. Fragmentation safe-arm switch *(figure 9)*—Set to the desired position—"ARM" or "SAFE."

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.

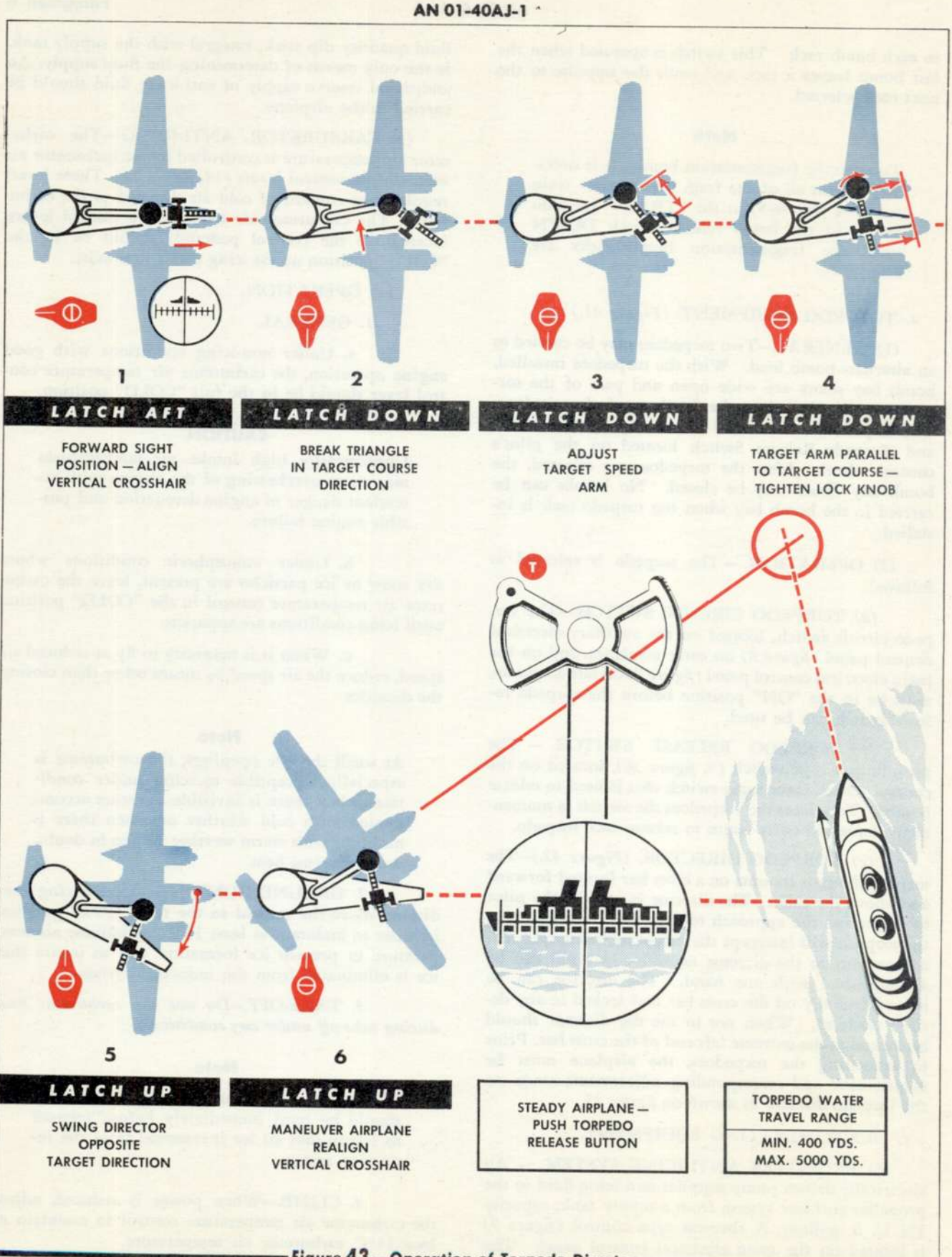
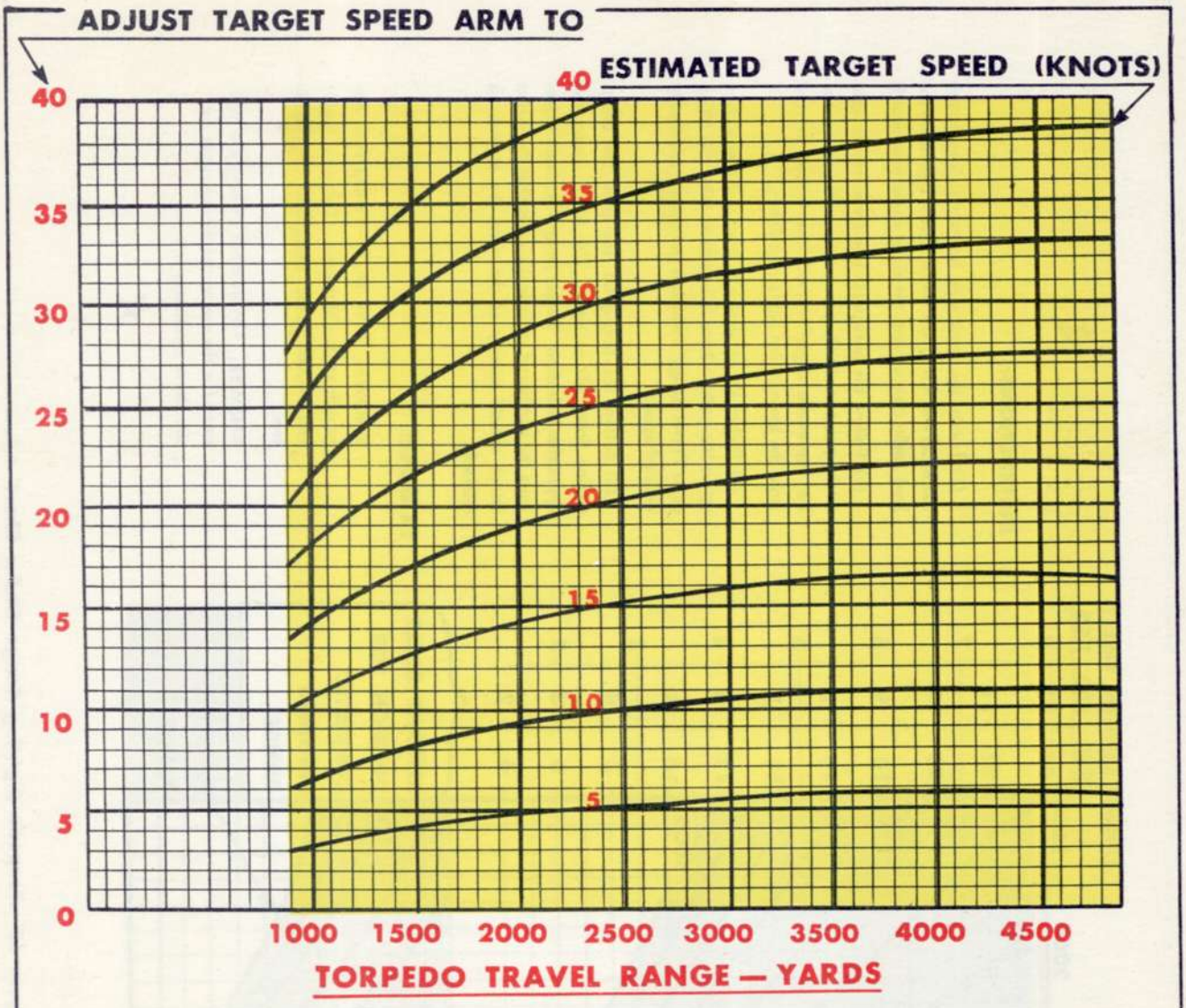


Figure 43 — Operation of Torpedo Director



INSTRUCTIONS:

(1) Locate the applicable vertical line, terminating at the bottom of the chart, which represents the estimated torpedo travel range.

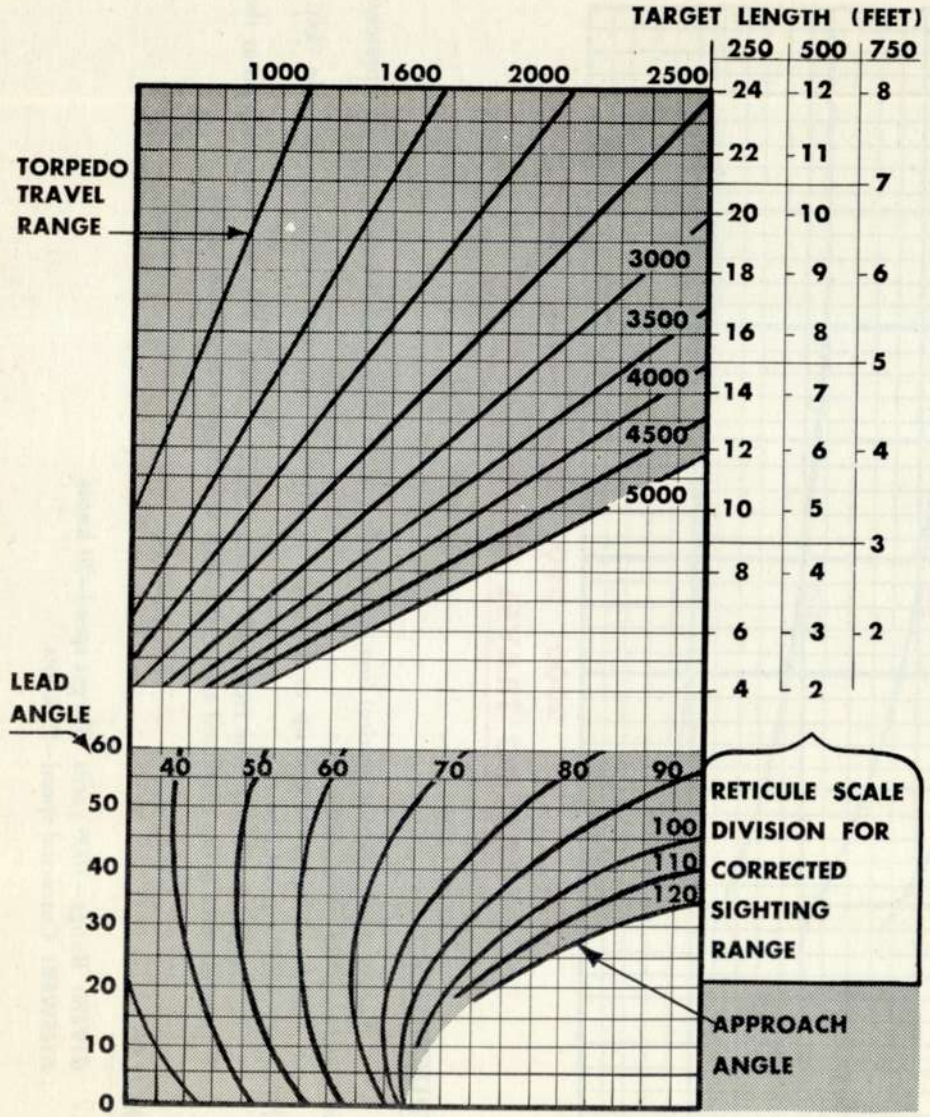
(2) Follow this vertical line up to the point at which it intersects with the applicable "Estimated Target Speed" curved line.

(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.

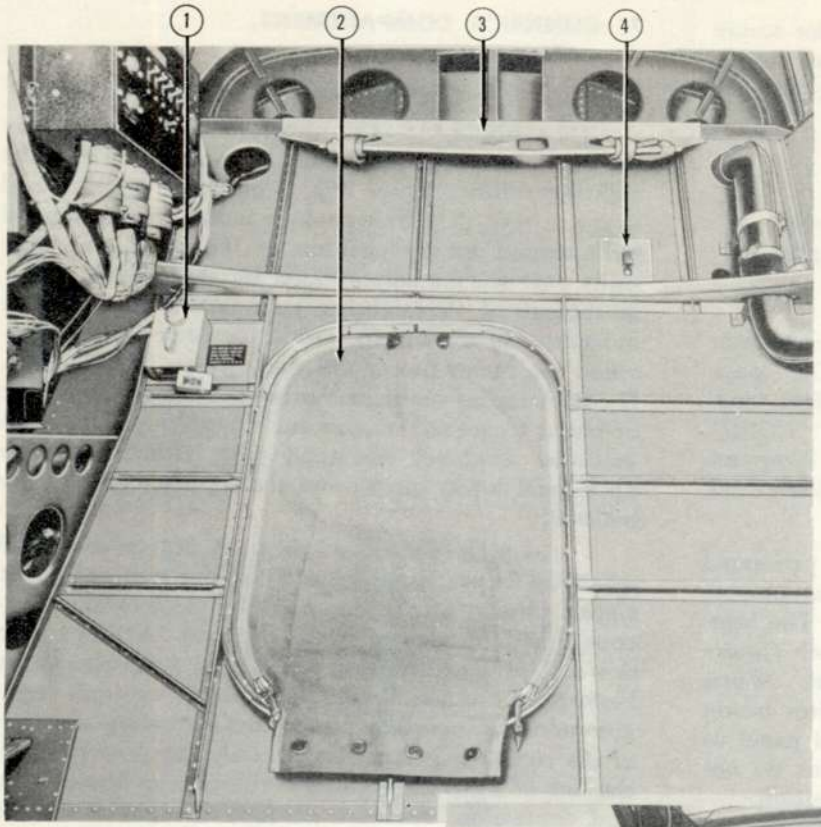
(b) CONTROLS ON SIGHT UNIT.

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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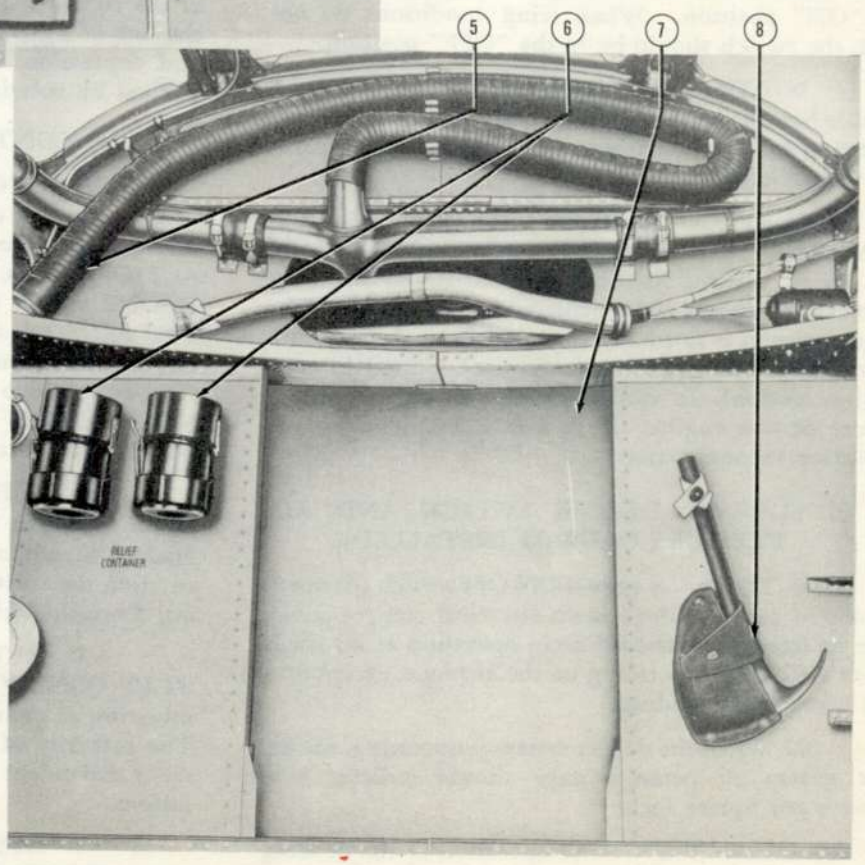

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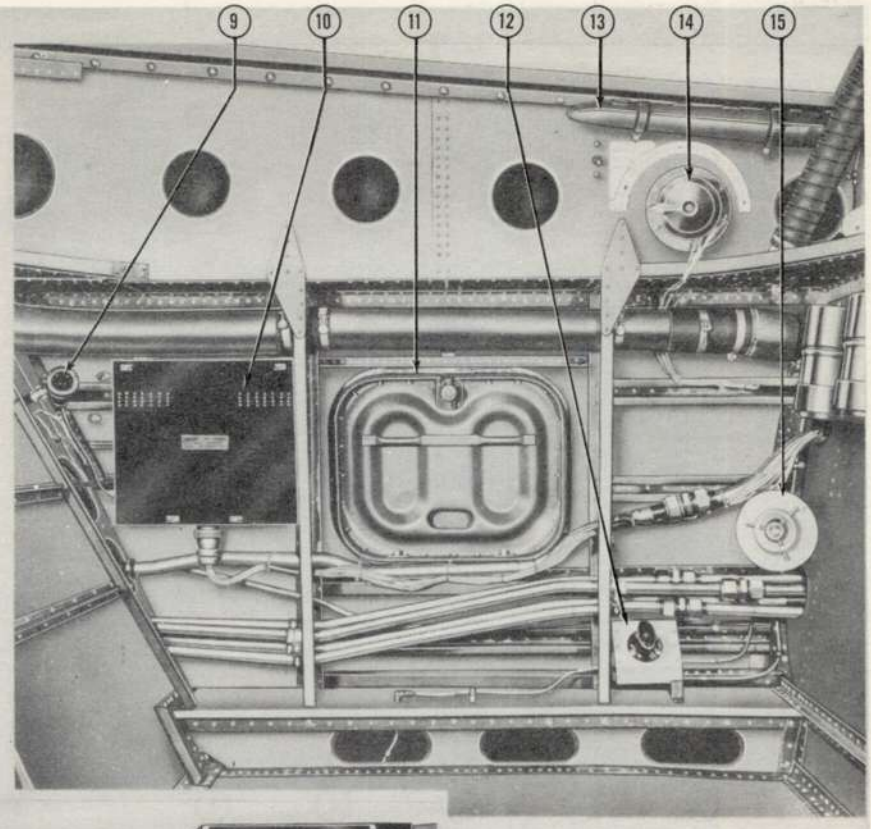
5. Hot Air Spot Defroster and Handwarmer
6. Relief Containers
7. Fuselage Aft Section Access Door
8. Fire Axe

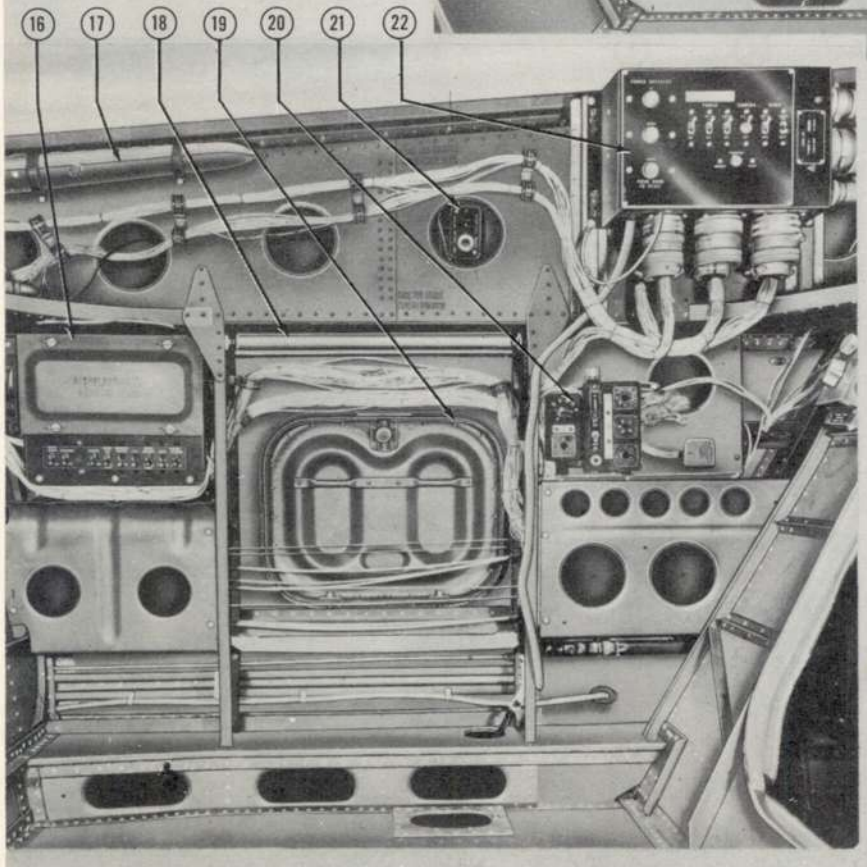
VIEW LOOKING AFT

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





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)

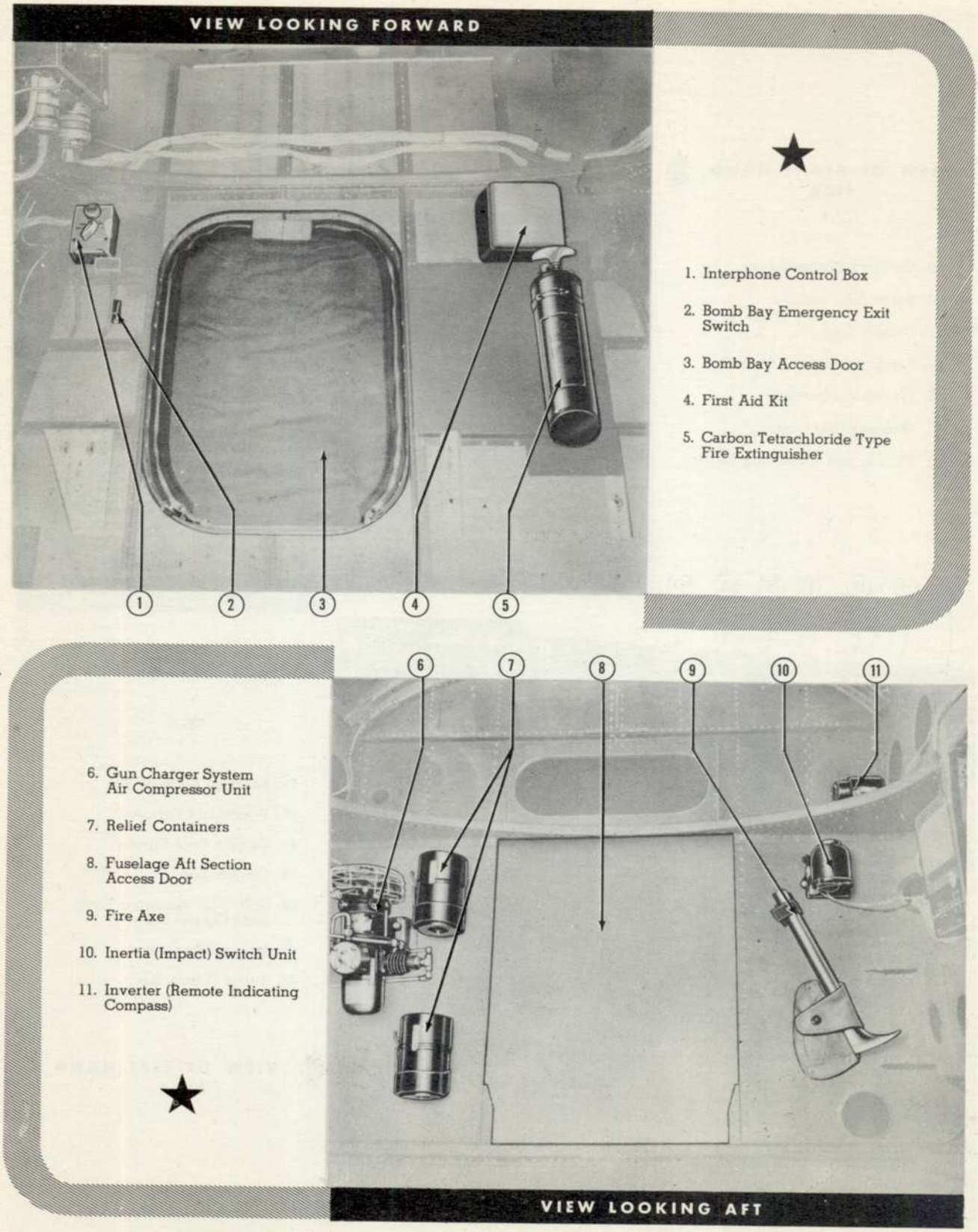


Figure 47 (Sheet 1 of 2)—Gunner's Compartment (on Other Airplanes)

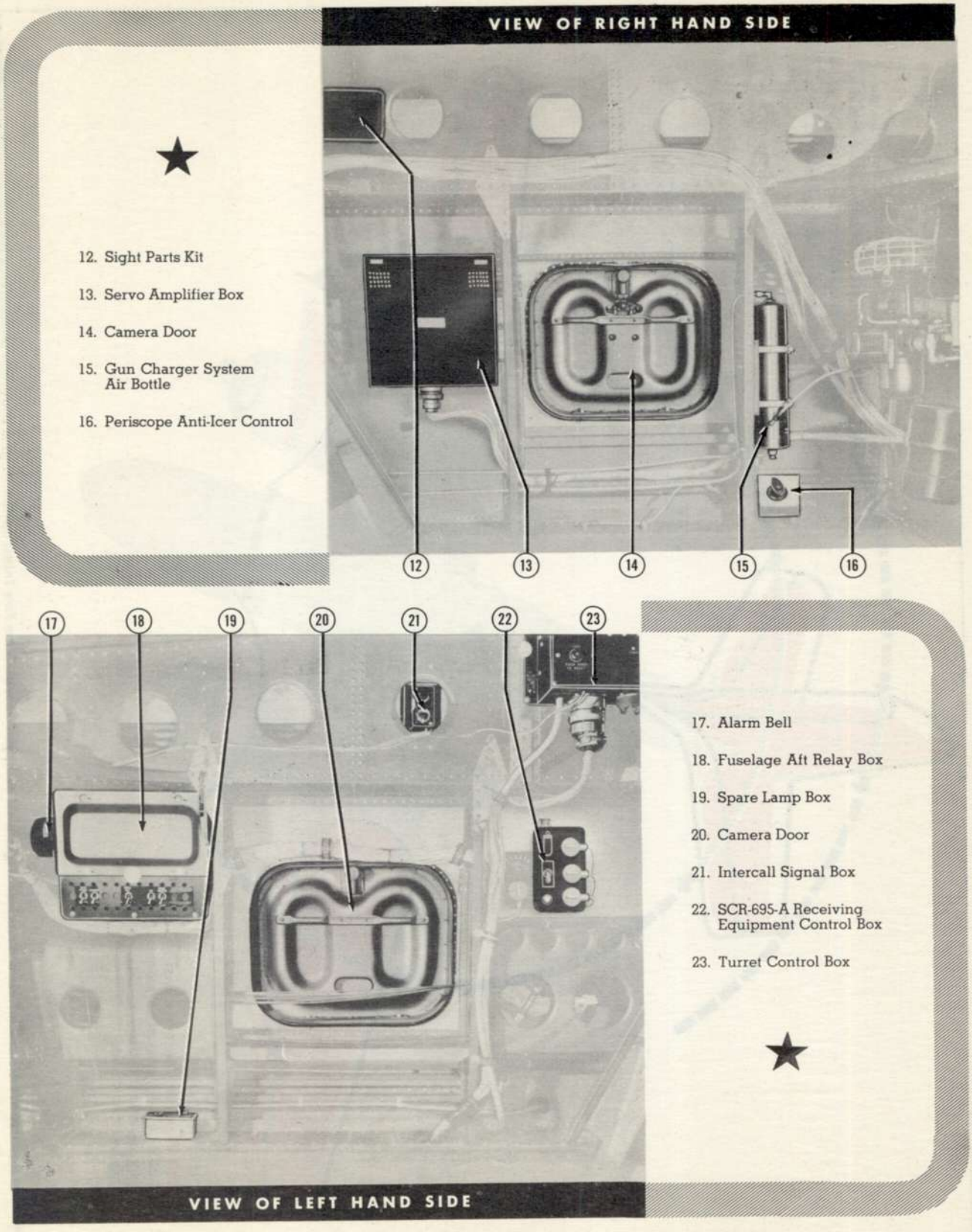


Figure 47 (Sheet 2 of 2)—Gunner's Compartment (on Other Airplanes)

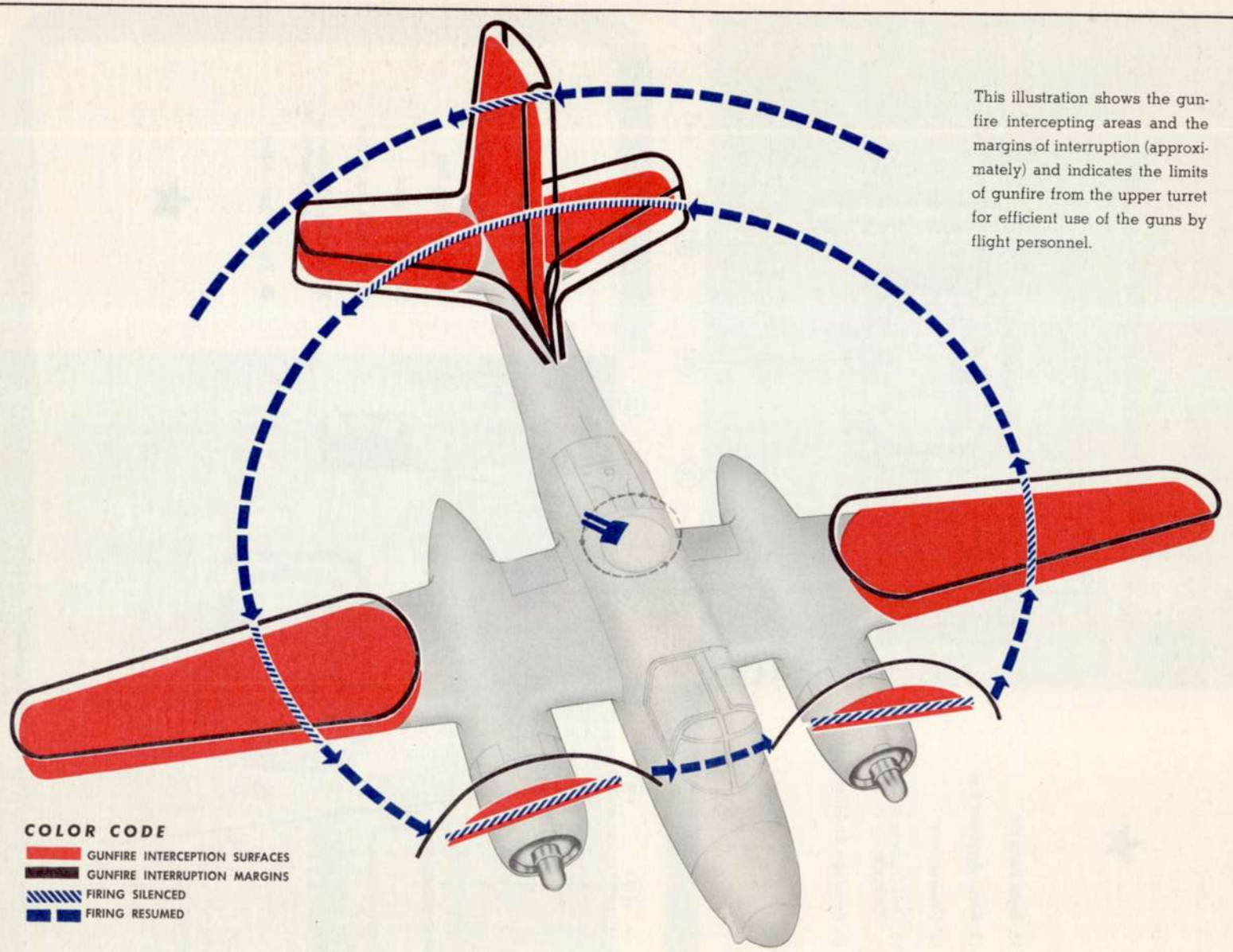


Figure 48 — Upper Turret Guns Fire Interruption Angles Diagram

(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.

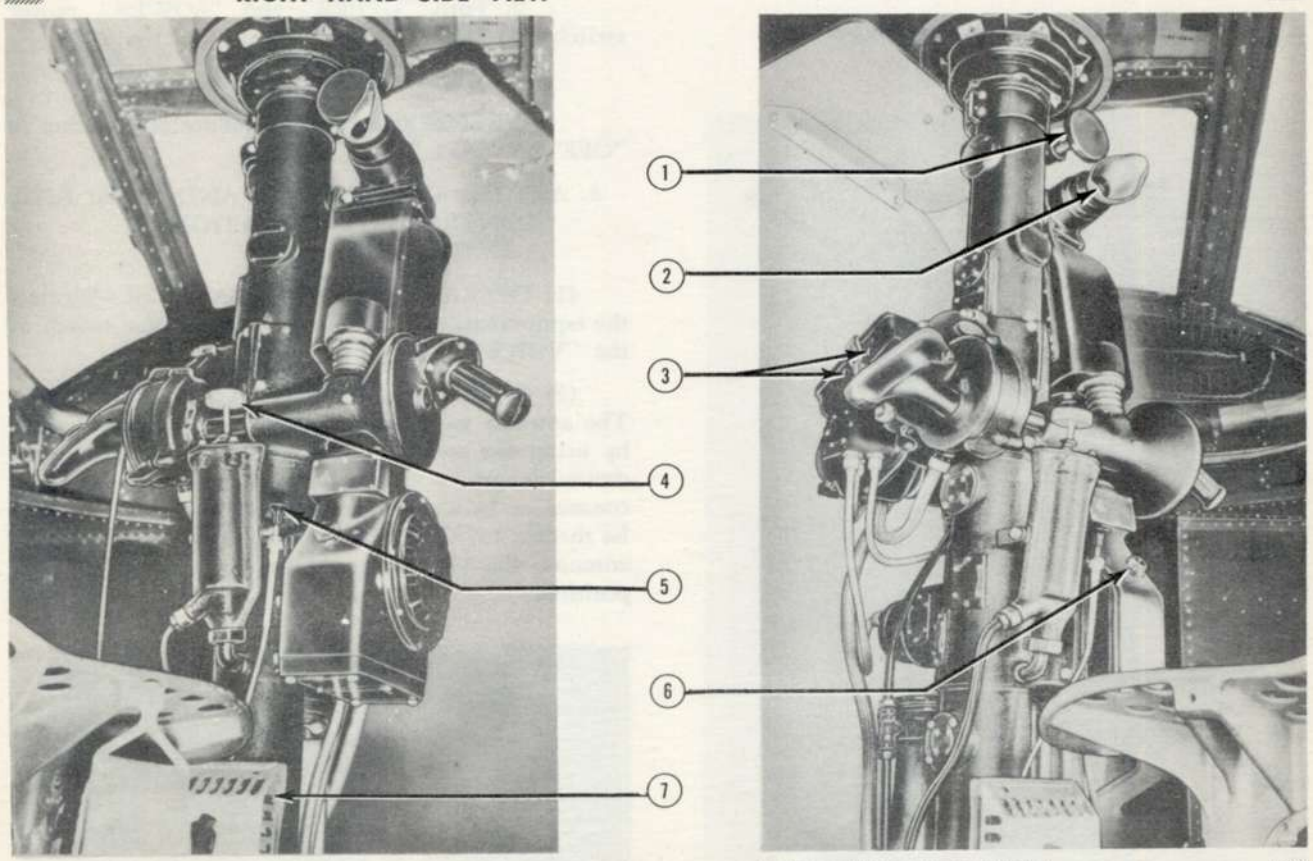
3. TRANSFER SWITCH.—When the transfer switch is in the "GUNNER" position, both turrets can be operated only by the gunner. On airplanes using the flat type canopy, when the transfer switch is in the "PILOT" position, and the upper turret is in the "straight forward" position, the pilot has complete control 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.

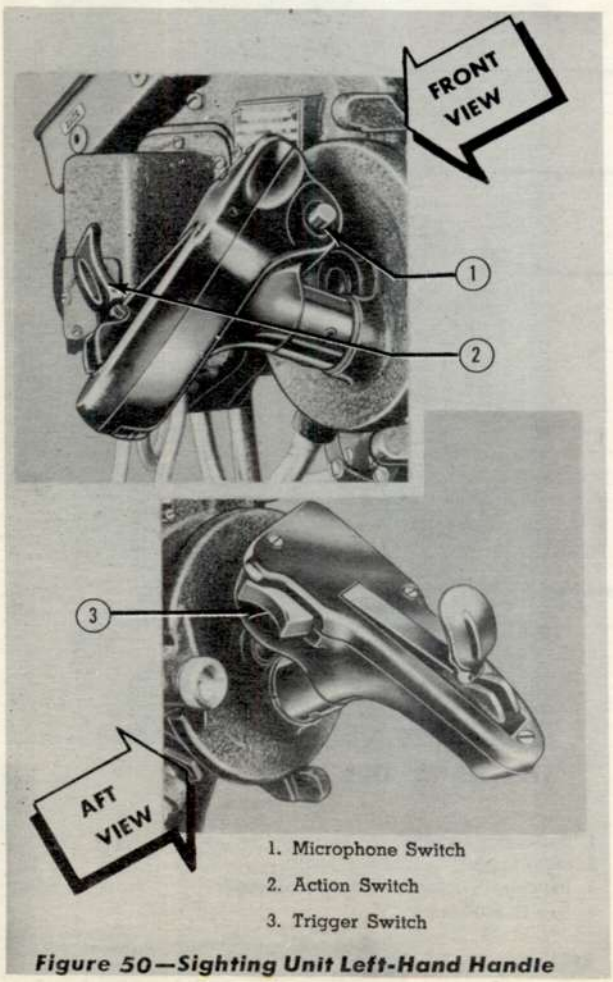


Figure 50—Sighting Unit Left-Hand Handle

(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.

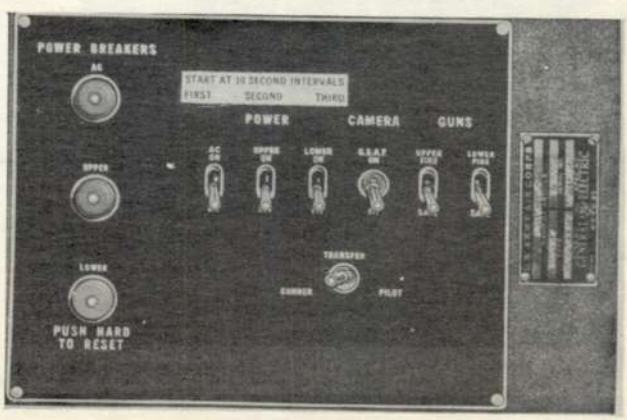


Figure 51—Turret Control Box

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.

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 on 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 5 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 "APC-BEACON" switch on "APC-OFF" and then on "BEACON." 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 55A).

(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 "E." Pilot light should go on.

(b) In an emergency, the equipment may also be stopped by pressing pushbutton on controller 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.) (B-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.

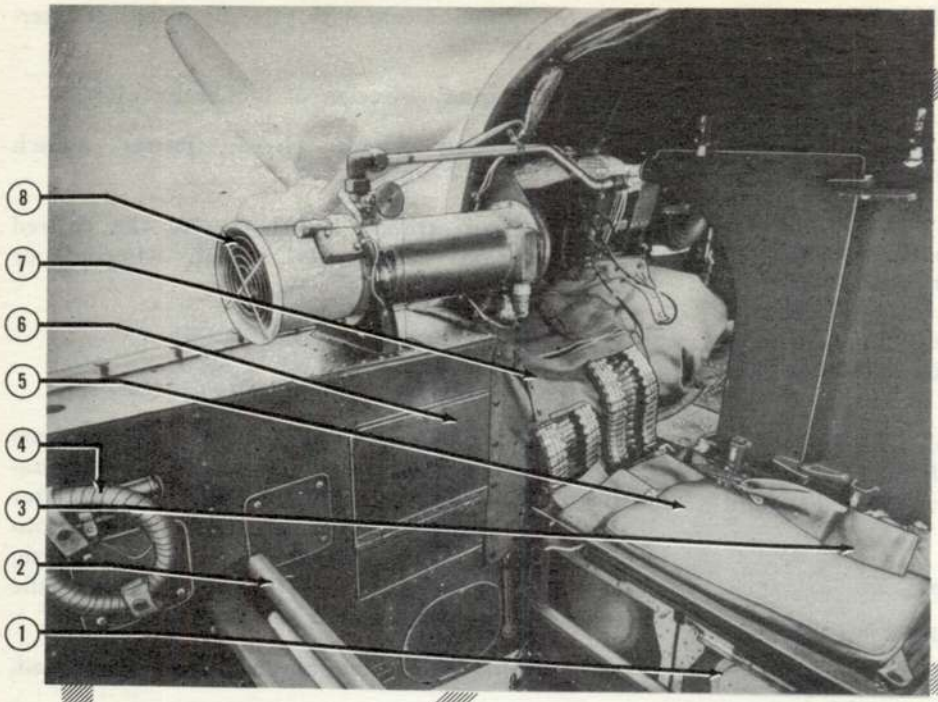
(i) Bomb bay door switch—"CLOSED."

(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.

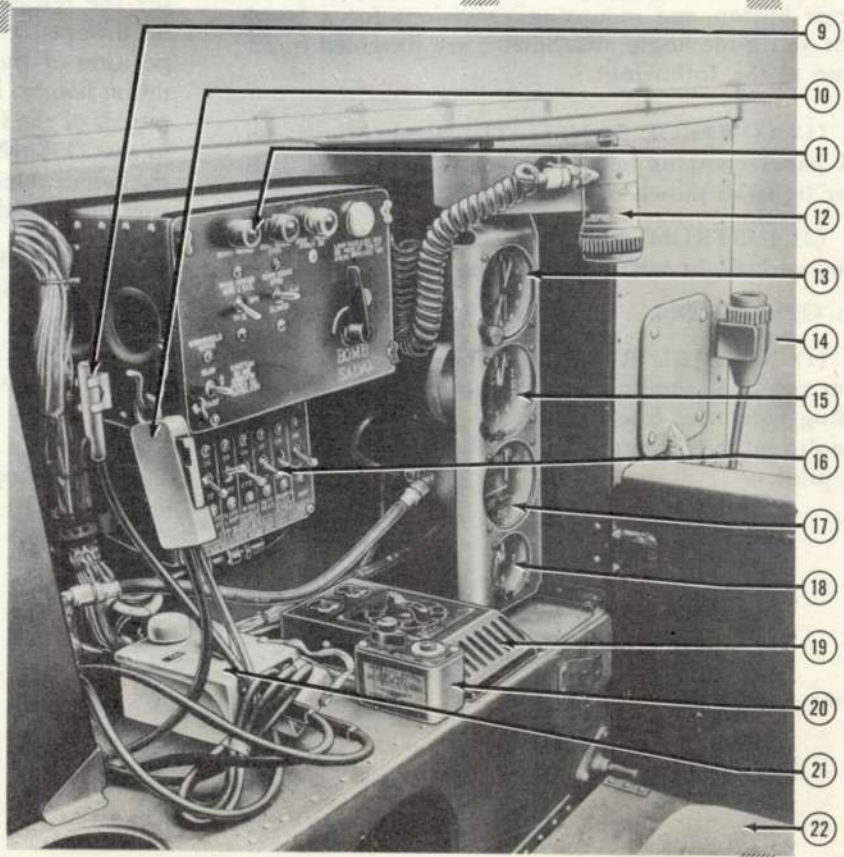
CAUTION

Do not operate wiper on dry glass.



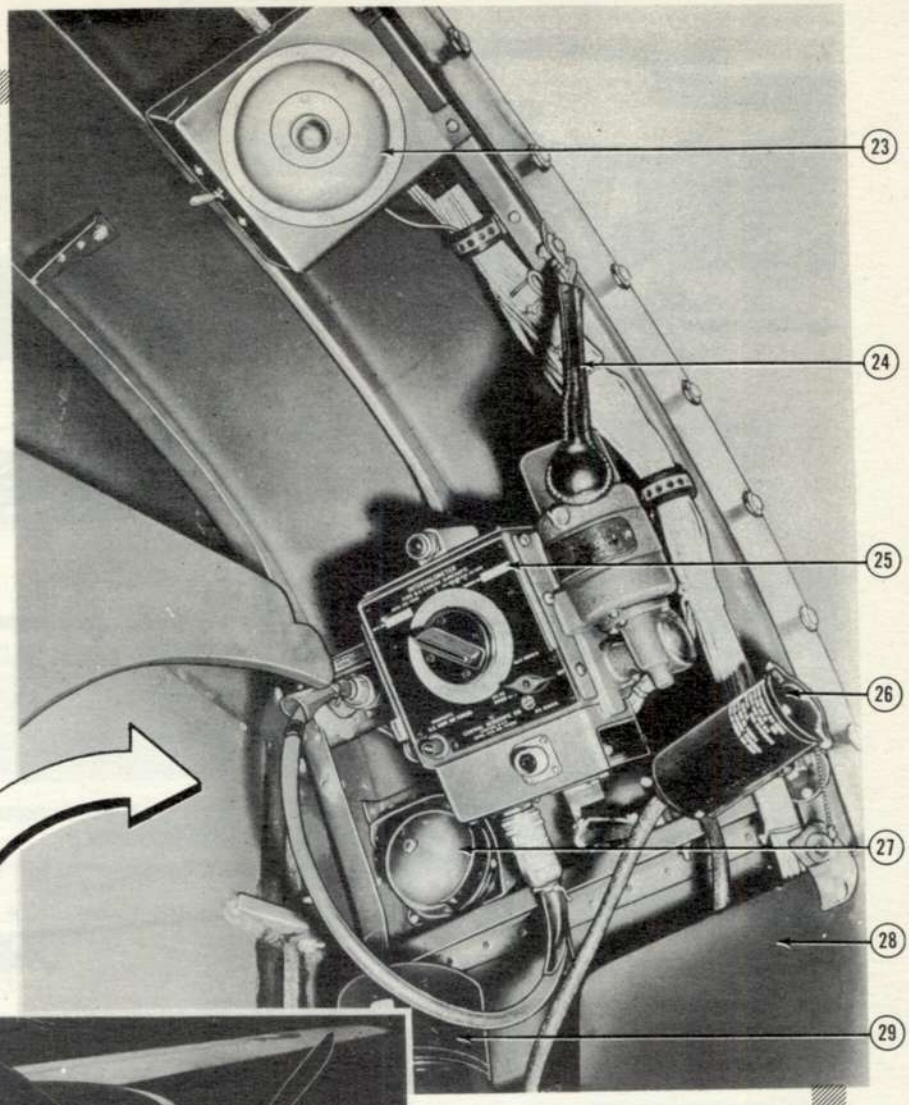
1. Ammunition Boxes
2. Bombardiers' Folding Floor
3. Bombardiers' Safety Belt
4. Heat Outlet Hose (Flexible)
5. Bombardiers' Seat Pad
6. Data Case
7. Cover (for Guns)
8. Recirculating Heater

- STEWART-WARNER HEATER INSTALLATION SHOWN
- ANY OTHER TYPE HEATER INSTALLATIONS WOULD NOT APPEAR IN THESE VIEWS

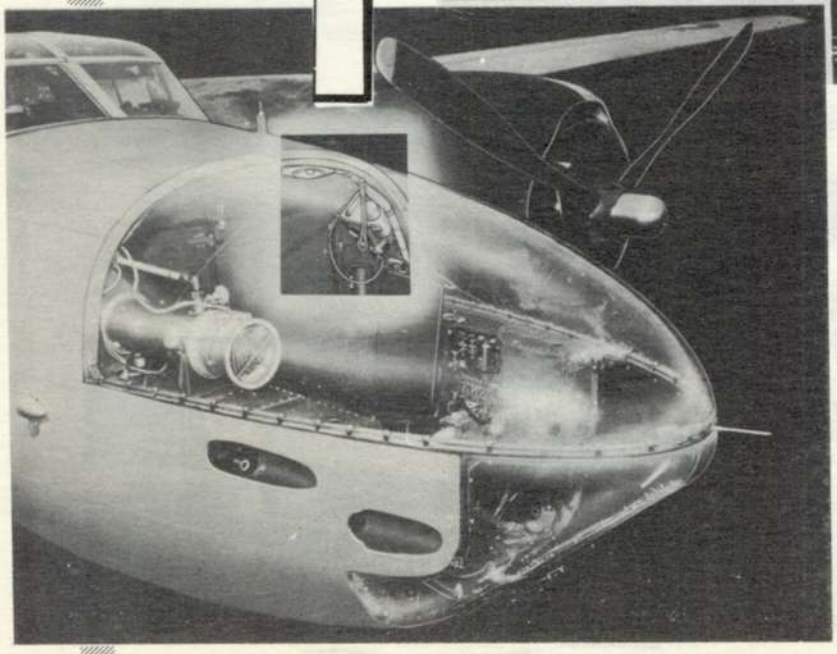


9. Interphone Jack
10. Microphone Switch
11. Bombardiers' Control Panel
12. Fluorescent Instrument Light
13. Remote Compass Indicator
14. Bomb Release Control
15. Altimeter
16. Circuit Breaker Panel
17. Airspeed Indicator
18. Clock
19. Suit Heat Rheostat
20. Inter-Call Signal Box Assembly
21. Interphone Jack Box
22. Bombardiers' Kneeling Pad

Figure 52 (Sheet 1 of 2) — Bombardier's Compartment

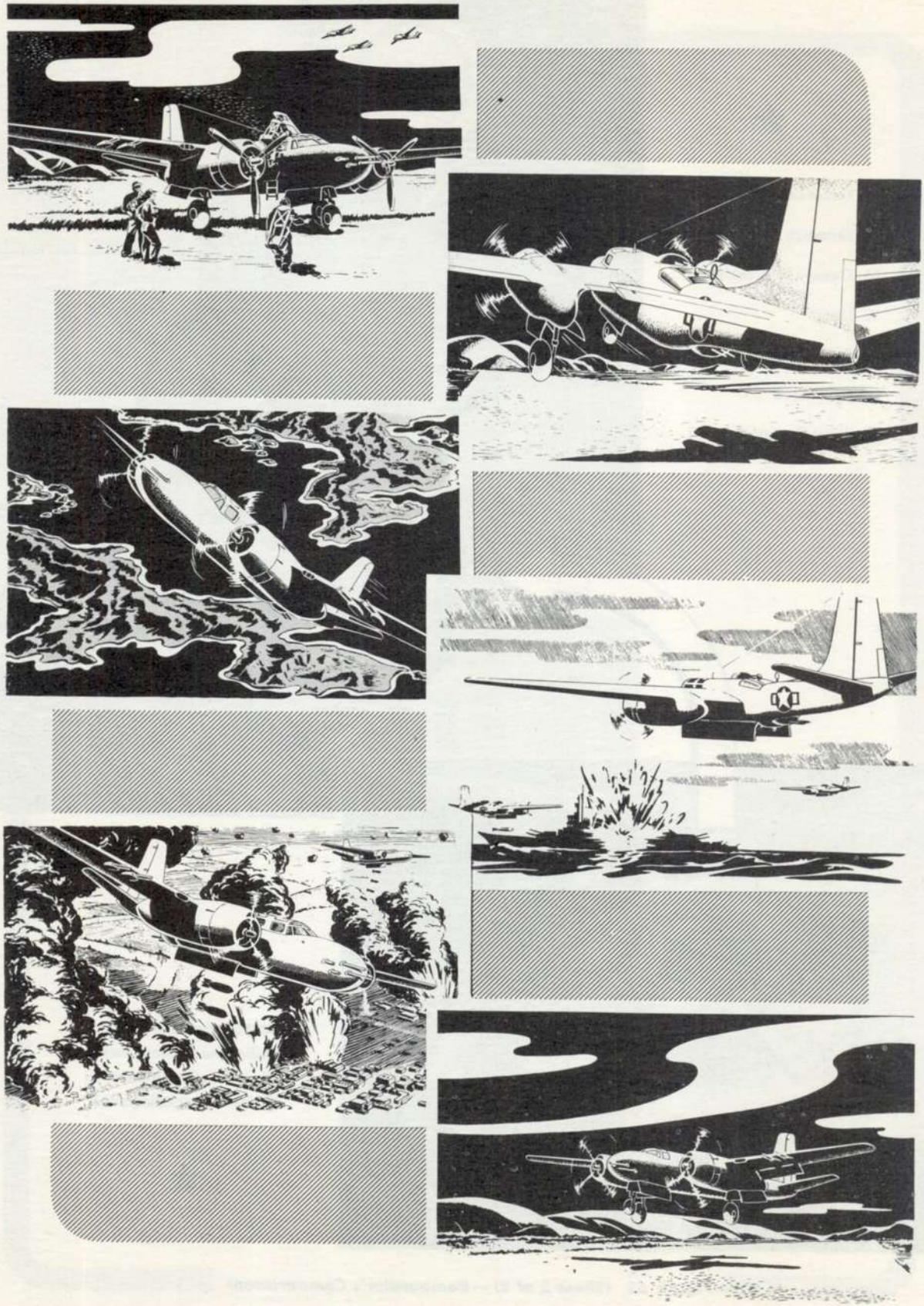


23. Dome Lamp
24. Entrance Assist Strap
25. Camera Intervalometer
26. Lamp
27. Alarm Bell
28. Data Board
29. Relief Container



Right hand exterior view of bombardier's compartment with detail of equipment not shown on preceding page

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.

(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 — OPERATING CHARTS

A-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)*.

A-2. FLIGHT PLANNING.

A-3. GENERAL.

A-4. A series of charts are provided on the following pages to aid in selecting the speeds and powers required to obtain various ranges. These charts are divided into two sets: (1) Take-off, Climb and Landing Chart, (2) Flight Operation Instruction Chart.

A-5. These charts are provided to give the pilot sufficient data to lay out a safe and efficient flight plan. Inasmuch as the number of variables involved make very accurate range predictions impossible, the ranges and fuel flows quoted are conservative. For example, estimated data (shown in red) are 15% conservative and data based on flight test data (shown in black) are 5% conservative. The speeds quoted on any one chart are those obtained with gross weight equal to the high limit of the weight band shown on the chart. This policy along with the previously mentioned 15% or 5% conservatism makes allowances for differences in airplanes such as speeds, fuel flows, engine power output, pilot technique, etc. *No allowances* have been made for wind, navigational error, combat, formation flights, or reserve. Appropriate allowances should be dictated by local policy.

A-6. The charts are arranged to give maximum utility for pre-flight and inflight range planning. The following will be noted on inspection.

a. The climb chart gives fuel requirements for warm-up, take-off, and climb to any altitude for four typical weights. The fuel tabulated in the column labeled "at sea level" shows the allowance for warm-up, taxi, and take-off. Fuel requirements listed at other altitudes include this allowance plus the fuel required to climb from sea level. If it is desired to determine the fuel required to make an in-flight climb from one altitude to another, i.e., 15,000 feet to 30,000 feet, the difference of the tabulated fuel required to these two altitudes will be the climb fuel necessary.

b. Take-off and landing distances are shown for various combinations of gross weight, field altitude, winds and type runways.

c. Nine Flight Operating Instruction Charts covering the various loading combinations for this airplane are presented.

d. Maximum to minimum practical fuel loadings are entered on each chart under the fuel column.

e. Data listed under Column I is for high speed cruising at max continuous (normal rated power). Columns II, III, IV, and V give progressive increases in range with a sacrifice in speed. Ranges shown in any column for a given fuel quantity can be obtained at various altitudes by using the power settings listed in the lower half of the chart in the same column.

f. Ranges shown on a given chart are based on fuel flows obtained by resetting power as gross weight changes to lower weight bracket on succeeding charts.

A-7. USE OF CHARTS.

A-8. The following sample problem is based on a typical B-26 mission and employing actual chart values demonstrates how the charts should be used.

A-9. It is required to ferry an B-26B 2200 miles.

A-10. Conditions of the problem:

Ferry B-26B—2000 miles
First 1000 miles at 5000 feet—10 mph tailwind
Last 1200 miles at 15,000 feet because of terrain—50 mph headwind
No external load items

A-11. Determination of the actual flight plan.

a. Examination of the Flight Operation Instruction Charts (page 115) shows that the flight for no wind and no reserve or allowances will require between 1100 and 1400 gallons depending on the desired airspeed. Assume the flight will be made with a total of 1600 gallons and a take-off weight of 35,000 pounds.

b. Now compute the allowances and reserve.

Warm-up, taxi, take-off, and climb to 5000 feet (obtained from climb chart, figure 55)	90
1 hour reserve at max range power settings at 15,000 feet at end of flight. (Page 117, 29,000 lb—26,000 lb, Column V, at 15,000 feet (135 gph)	135
In-flight climb 5000 feet to 15,000 feet	65

Obtained from Climb Chart, figure 55 (155 gal to 15,000 ft—90 gal to 5000 ft). Based on a 35,000 lb take-off weight. The actual weight at the end of 1000 miles will be less, so this allowance is conservative.

Allowances without including wind reserve:
90+135+65=290

After subtracting the 290 gallon allowance from the take-off fuel (1600 gal), 1310 gallons are available for cruising. Reference to Flight Operation Instruction Chart (page 115), Column V indicates that with 1300 gallons you can fly 2525 miles with no wind.

Wind Reserve:

First 1000 miles, tailwinds are normally neglected. Last 1200 miles, Flight Operation Instruction Chart (page 115), Column V shows that less than 600 gallons will be required for the first 1000 miles. These 600 gallons plus allowances for warm-up, take-off, and climb to 5000 feet plus the fuel to climb from 5000 feet to 15,000 feet total 755 gallons. The gross weight at the start of the last 1200 miles will be approximately 30,470. 35,000—4530 (755 gallons at 6 lb per gallon).

Flight Operation Instruction Chart (page 116) (32,000 lb—29,000 lb), Column V. TAS at 15,000 feet =266 mph and the fuel flow is 135 gph.

No-wind time is 4.51 hr (1200 miles)

(266 TAS)

Actual time is 5.56 hr 1200 =1200

Ground speed (266—50) 216

Fuel required for wind is 142 gallons, (5.56—4.51) x 135 gph.

Total allowances for warm-up, take-off, climb, wind and 1½ hour reserve is 432 gallons.

c. Fuel available for flight is 1168 gallons.

Referring again to Column V (page 115) 1100 gallons will allow a flight of 2115 miles and 1200 gallons are required for 2320 miles (no wind). 1168 gallons will permit a flight of at least 2200 miles. In order to achieve the desired range, the flight must be made under the operating instructions listed in Column V of the charts.

d. A tabulation of the flight data will permit a detailed check of the original estimates and provide a useful in-flight reference.

Take-off weight .....35,000 lb
(Includes a bomb bay tank and fuselage ferry tank with a total of 1600 gallons aboard.)

Leg	*Wt Change*	*Fuel Abd.*	*Cond.*	*Alt.*	*Power Settings*	*Fuel Used*	*Dist*	*Dist. From Take-off*
1	35,000 to 34,460	1600	Warm-up Take-off Climb	S.L. to 5000′	2400 rpm 42″ M.P. Auto Rich	90	0	0

Data obtained from climb chart, figure 55, time and distance covered in climb is neglected in this case.

The flight is computed in Column V of the Flight Operation Instruction Charts.

Leg	*Fig.*	*Wt Change*	*Fuel Remaining*	*Power Settings*	*GPH*	*TAS*	*Ground Speed*	*Hours*	*Fuel Used*	*Dist*	*Dist From Take-off*
2	56 Page 115	34,460 to 32,000	1510	1900 RPM 31″ MP Auto Lean	125	234	234	3.28	410	768	768

Note: Length of Leg 2 is determined by the time required for the gross weight to decrease to 32,000 pounds.

FUEL USED AND WEIGHT DECREASE:

34,460—32,000=2460 lb or 410 gal.

RPM, MP, MIXTURE, TAS, AND GPH:

These items are read directly opposite 5000 feet in Column V.

HOURS:

Fuel used divided by fuel flow $\frac{410}{125}$=3.28

DISTANCE:

Ground speed x hours 3.28 x 234=768

Now that the gross weight has been reduced to 32,000 pounds, the operating instructions on page 116 will be used (32,000 lb to 29,000 lb).

Leg	*Fig.*	*Wt Change*	*Fuel Remaining*	*Power Settings*	*GPH*	*TAS*	*Ground Speed*	*Hours*	*Fuel Used*	*Dist*	*Dist From Take-off*
3	56 Page 116	32,000 to 31,310	1100	1850 RPM 27.5″ MP Auto Lean	110	223	223	1.04	115	232	1000

Note: Length of Leg 3 is determined by the distance remaining to point at which climb to 15,000 feet is started.

HOURS:

Distance divided by ground speed $\frac{232}{223}$=1.04

FUEL USED:

Gallons per hour x time, 110 x 1.04=115

WEIGHT CHANGE:

Fuel used at 6 lb per gal 115 x 6=690

32,000—690=31,310

Leg	*Fig.*	*Wt Change*	*Alt*	*Fuel Remaining*	*Power Settings*	*Fuel Used*	*Dist*	*Dist From Take-off*
4	55	31,310 to 30,980	5000′ to 15,000′	985	2400 RPM 42″ MP Auto Rich	55	0	1000

Note: Fuel used in climb from 5000 feet to 15,000 feet is the difference in fuel listed for 32,000 lb on the climb chart at 15,000 feet and 5000 feet, i.e., 140 — 85=55 gallons. The time and distance is neglected in this case.

Leg	Fig.	Wt Change	Fuel Remaining	Alt	Power Settings	GPH	TAS	GS	Hours	Fuel Used	Dist	Dist From Take-off
5	56 Page 116	30,980 to 29,000	930	15,000′	2000 RPM 30″ MP Auto Lean	135	266	216	2.44	330	528	1528

Note: Length of Leg 5 is determined by the time required for the gross weight to decrease to 29,000 pounds.

FUEL USED AND WEIGHT DECREASE:

30,980 lb — 29,000 lb=1980 lb or 330 gal.

HOURS:

Fuel used divided by fuel flow $\frac{330}{135}$ =2.44.

GROUND SPEED:

TAS — wind (266 — 50)=216

DISTANCE:

Ground speed x hours 2.44 x 2.16=588

Now that the gross weight has been reduced to 29,000 pounds, the operating instructions on page 117 will be used.

Leg	Fig.	Wt Change	Fuel Remaining	Alt.	Power Settings	GPH	TAS	Ground Speed	Hrs.	Fuel Used	Dist	Dist From Take-off
6	56 Page 117	29,000 to 27,570	600	15,000′	2000 RPM 30″ MP Auto Lean	135	274	224	3.0	405	672	2200

Note: Length of Leg 6 is determined by the distance remaining to destination.

GROUND SPEED:

TAS — wind 274 — 50=224

HOURS:

Distance divided by ground speed $\frac{672}{224}$ =3.0

FUEL:

Gallons per hour x hours 135 x 3=405

A-12. Calculated fuel remaining at the end of flight is 195 gallons (600 — 405). The original required reserve of 205 gallons was computed at 135 gph. The 195 gallons remaining will provide a reserve of 1 hour and 25 minutes.

Leg	Fix	W/V Change Remaining	Fuel	Alt.	Power Setting	GPH	T.A.S.	Ground Track	Hdg. Ind.	Fuel Used	Dist.	Dist From Fuel Used
5	Sa 30,000 Pass 310 310 29,690		420	18,000	2000 RPM 30" MP Auto Lean	145	246	216	214	130	530	1758

Note: Length of leg 5 is determined by the time required for the gross weight to decrease to 29,690 pounds.

FUEL USED AND WEIGHT DECREASE:

30,000 lb — 29,690 lb = 1980 lb or 330 gal.

HOURS:

Fuel used divided by fuel flow 330 = 2.44
135

Leg	Fix	W/V Change Remaining	Fuel	Alt.	Power Setting	GPH	T.A.S.	Ground Track	Hdg. Ind.	Fuel Used	Dist.	Dist From Fuel Used
6	Sa 27,000 Pass 310 310 27,370		420	18,000	2000 RPM 30" MP Auto Lean	135	216	214	40	405	877	2200

Note: Length of leg 6 is determined by the distance remaining to destination.

GROUND SPEED:

TAS — wind 274 — 50 = 224

HOURS:

Distance divided by ground speed 677 = 3.0
224

GROUND SPEED:

TAS — wind (266 — 50) = 216

DISTANCE:

Ground speed x hours 2.44 x 2 = 538

Now that the gross weight has been reduced to 29,000 pounds, the operating instructions on page 1127 will be used.

FUEL:

Gallons per hour x hours 135 x 3 = 405

A-12. Calculated fuel remaining at the end of flight is 195 gallons (600 — 405). The original required reserve of 265 gallons was computed at 135 gph. The 195 gallons remaining will provide a reserve of 1 hour and 25 minutes.

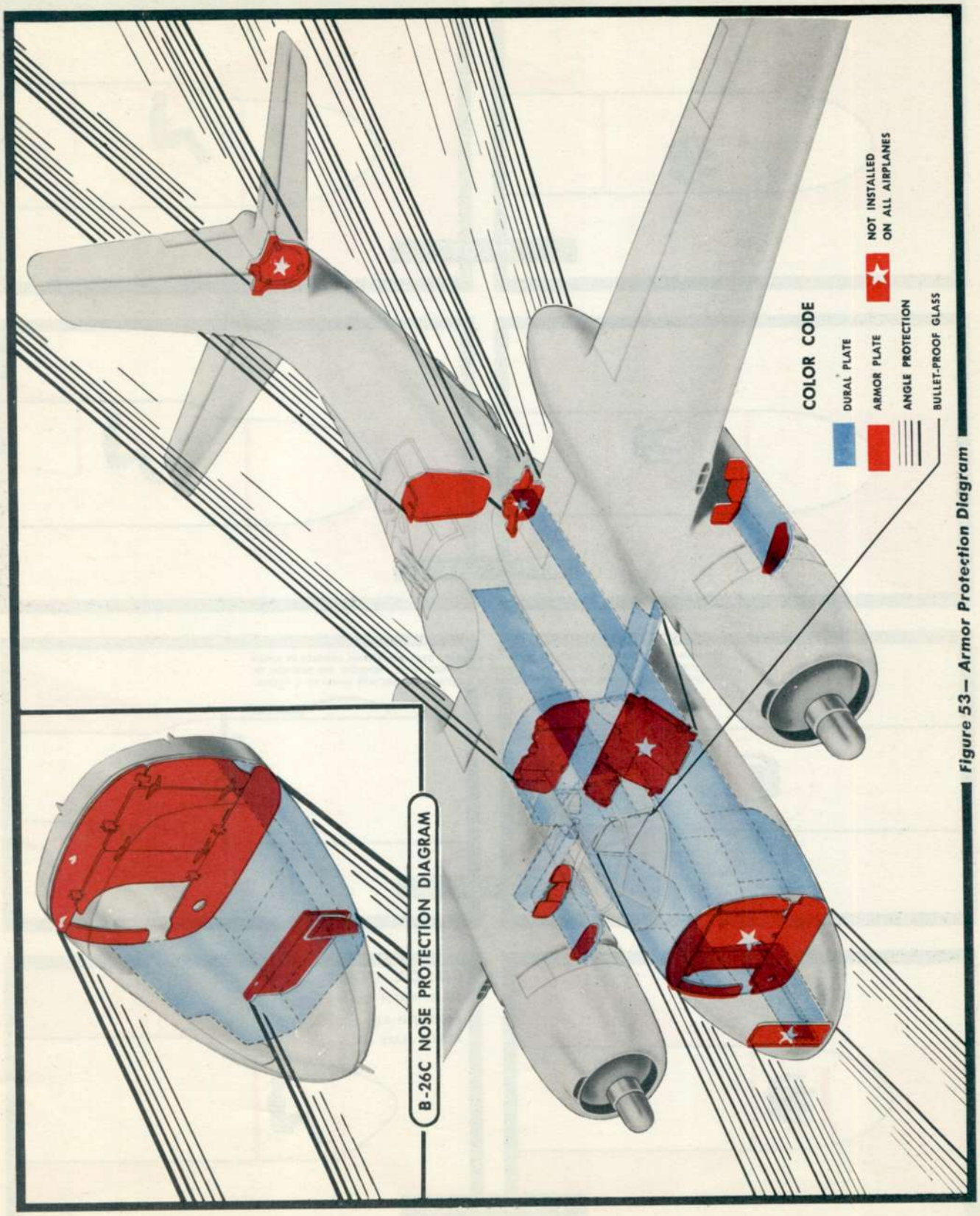


Figure 53— Armor Protection Diagram

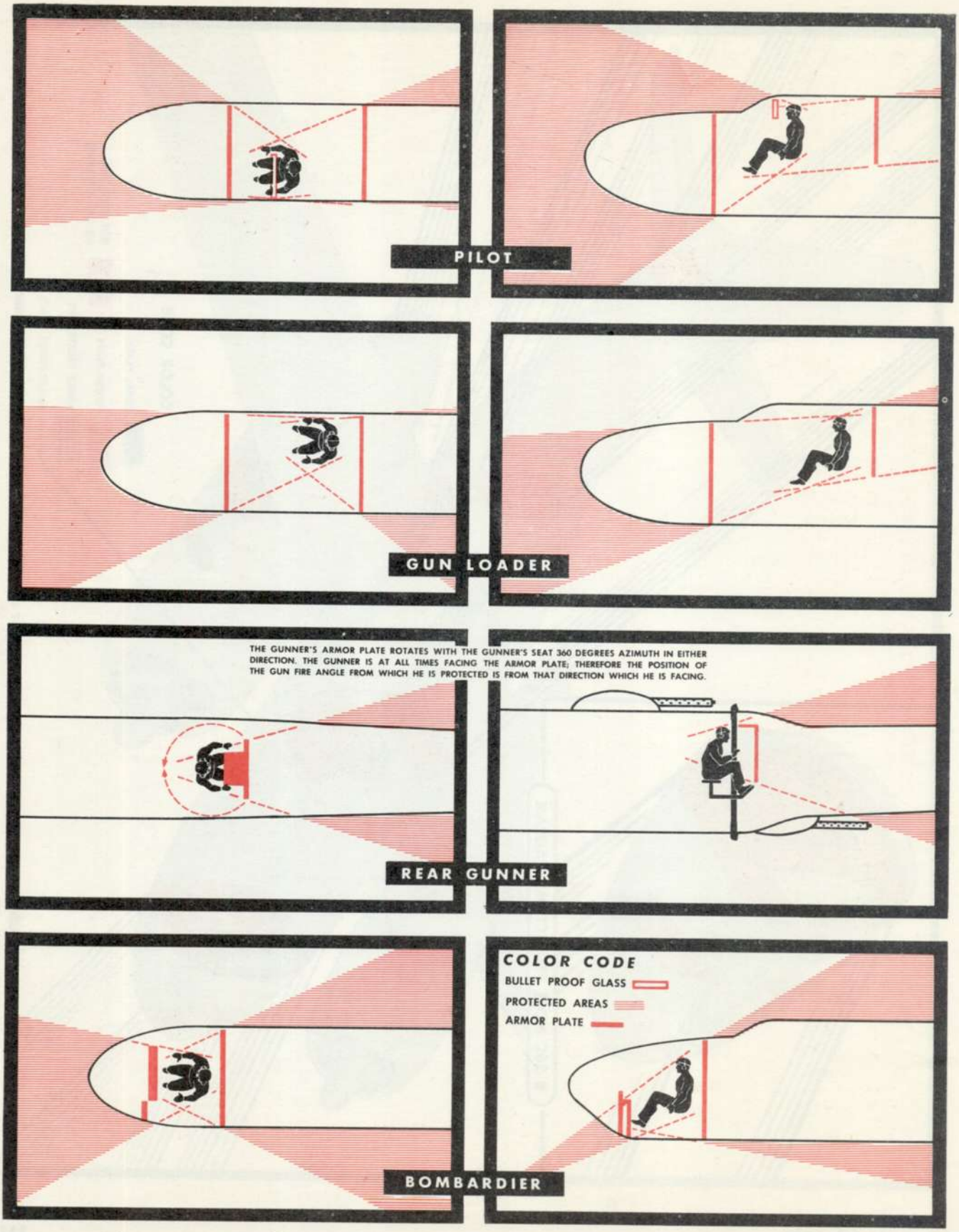


Figure 54– Individual Crew Member Armor Protection Diagram

AIRCRAFT MODEL(S) B-26B & B-26C CLEAN & FERRY CONFIGURATION

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S) P. & W. R-2800-27,-71,&-79

AAFMC-527 6-1-44

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%

OPTIMUM TAKE-OFF WITH 2700 RPM, 52 IN. HG. & 20 DEG. FLAP IS 80% OF CHART VALUES

DATA AS OF *6 NOV. 1944* BASED ON: *FLIGHT TESTS*

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.		RATE OF CLIMB F.P.M.	GAL. OF FUEL USED	BEST I.A.S.		RATE OF CLIMB F.P.M.	FROM SEA LEVEL		BEST I.A.S.		RATE OF CLIMB F.P.M.	FROM SEA LEVEL		BEST I.A.S.		RATE OF CLIMB F.P.M.	FROM SEA LEVEL		BEST I.A.S.		RATE OF CLIMB F.P.M.	FROM SEA LEVEL		BEST I.A.S.		RATE OF CLIMB F.P.M.	FROM SEA LEVEL		
	MPH	KTS			MPH	KTS		TIME MIN.	FUEL USED GAL.	MPH	KTS		TIME MIN.	FUEL USED GAL.	MPH	KTS		TIME MIN.	FUEL USED GAL.	MPH	KTS		TIME MIN.	FUEL USED GAL.	MPH	KTS		TIME MIN.	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

2400 RPM, 42 IN. Hg M.P.

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

DATA AS OF *2 OCT. 1944* BASED ON: *FLIGHT TESTS*

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 6-1-44

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

ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 35000 TO 32000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: TWO

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.	HIGH	A.R.	5 min.	260°C	500
	2700	F.T.	LOW	A.R.	5 min.	260°C	520
MILITARY POWER	2700	47	HIGH	A.R.	5 min.	260°C	540
	2700	52	LOW	A.R.	5 min.	260°C	580

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					
STATUTE		NAUTICAL	GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
			1600	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																		1600						
1335		1160	1535	1985		1725				2425		2105				2690		2335				1535	2975		2585			
1305		1130	1500	1935		1680				2365		2055				2625		2280				1500	2935		2550			
1215		1055	1400	1795		1560				2195		1905				2430		2110				1400	2730		2370			
1130		980	1300	1655		1440				2025		1760				2245		1950				1300	2525		2190			
1040		905	1200	1515		1315				1855		1610				2060		1790				1200	2320		2015			
955		830	1100	1375		1195				1685		1460				1875		1630				1100	2115		1835			
865		750	1000	1235		1070				1515		1315				1690		1465				1000	1910		1660			
780		680	900	1110		965				1355		1175				1515		1315				900	1710		1485			
690		600	800	985		855				1195		1035				1340		1165				800	1515		1315			
605		525	700	860		750				1035		900				1165		1010				700	1315		1040			
515		445	600	735		640				875		760				990		860				600	1120		975			

MAXIMUM CONTINUOUS						PRESS	(1.22 STAT. (1.06 NAUT.) MI./GAL.)						(1.43 STAT. (1.24 NAUT.) MI./GAL.)						(1.65 STAT. (1.44 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	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.	185	290	252	25000																			25000						
2400	F.T.	A.R.	280	330	286	20000	2400	36.5	A.R.	270	326	283	2200	F.T.	A.R.	205	309	268	2100	F.T.	A.R.	175	285	248	20000	2050	28.0	A.L.	140	260	226
2400	42.0	A.R.	395	345	300	15000	2250	35.5	A.R.	270	330	286	2350	F.T.	A.R.	215	304	264	2150	F.T.	A.R.	175	284	247	15000	2050	F.T.	A.L.	145	271	235
2400	42.0	A.R.	380	325	282	10000	2250	34.5	A.R.	255	310	269	2150	31.5	A.R.	205	291	253	2050	32.5	A.L.	170	281	244	10000	1950	29.0	A.L.	135	255	221
2400	42.0	A.R.	370	325	282	5000	2200	35.5	A.R.	240	290	252	2100	33.0	A.L.	170	270	234	2050	32.5	A.L.	160	262	227	5000	1900	31.0	A.L.	125	234	203
2400	42.0	A.R.	365	305	265	S.L.	2150	36.5	A.R.	220	272	236	2100	33.0	A.L.	155	255	221	2000	33.0	A.L.	150	243	211	S.L.	1850	30.0	A.L.	115	210	182

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 35000 LB. GROSS WEIGHT WITH 1000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 1515 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2350 RPM AND F.T. IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-RICH, LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 32000#. THEN USE COLUMN III OF THE 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 56 (Sheet 1 of 3)—Flight Operation Instruction Chart

AAFMC-528 4-1-48

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

ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 32000 TO 29000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5 min.	260°C	500
EMERG.	2700	F.T.	LOW	A.R.	5 min.	260°C	520
MILITARY	2700	47	HIGH	A.R.	5 min.	260°C	540
POWER	2700	52	LOW	A.R.	5 min.	260°C	580

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				
STATUTE		NAUTICAL	GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL		
SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																											
1140		990	1300	1745		1515				2160		1875				2355		2045				1300	2630		2280		
1050		910	1200	1605		1395				1990		1730				2170		1885				1200	2425		2105		
965		840	1100	1465		1270				1820		1580				1985		1725				1100	2220		1930		
875		760	1000	1325		1150				1650		1430				1800		1560				1000	2015		1750		
785		680	900	1185		1030				1480		1285				1615		1400				900	1810		1570		
700		610	800	1045		910				1310		1140				1430		1240				800	1605		1395		
610		530	700	905		785				1140		990				1245		1080				700	1400		1215		
525		455	600	765		665				970		840				1060		920				600	1195		1035		
435		380	500	625		545				800		695				875		760				500	990		860		
350		305	400	500		435				640		555				700		610				400	790		685		
260		225	300	375		325				480		415				525		455				300	595		515		

MAXIMUM CONTINUOUS						PRESS	(1.25 STAT. (1.09 NAUT.) MI./GAL.)						(1.6 STAT. (1.39 NAUT.) MI./GAL.)						(1.75 STAT. (1.52 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
																									25000						
2400	F.T.	A.R.	185	310	269	25000																			20000	2000	26	A.L.	130	258	224
2400	F.T.	A.R.	280	335	296	20000	2350	F.T.	A.R.	260	328	285	2150	F.T.	A.R.	190	306	266	2100	F.T.	A.L.	160	289	251	15000	2000	30.0	A.L.	135	266	231
2400	42.0	A.R.	395	350	304	15000	2200	34.0	A.R.	245	312	271	2200	F.T.	A.R.	185	298	259	2100	32.0	A.L.	165	286	248	10000	1900	28.0	A.L.	125	247	215
2400	42.0	A.R.	380	330	286	10000	2250	34.0	A.R.	250	312	271	2100	33.0	A.L.	185	294	255	2050	31.0	A.L.	160	280	243	5000	1850	27.5	A.L.	110	223	194
2400	42.0	A.R.	370	330	286	5000	2200	35.0	A.R.	235	292	254	2100	33.0	A.L.	170	275	239	2000	32.0	A.L.	150	260	226	S.L.	1700	28.5	A.L.	95	190	165
2400	42.0	A.R.	365	310	269	S.L.	2150	36.5	A.R.	220	274	238	2100	33.0	A.L.	155	260	226	1950	32.5	A.L.	140	239	208							

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 32000 LB. GROSS WEIGHT WITH 600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 300 GAL.) TO FLY 765 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2200 RPM AND 35. IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-RICH, LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 29000#. THEN USE COLUMN II OF THE 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 56 (Sheet 2 of 3)—Flight Operation Instruction Chart

AAFMC-528 4-1-44

AIRCRAFT MODEL(S)
B-26B & B-26C
ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 29000 TO 26000 POUNDS

EXTERNAL LOAD ITEMS
NONE
NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5 min.	260°C	500
EMERG.	2700	F.T.	LOW	A.R.	5 min.	260°C	520
MILITARY POWER	2700	47	HIGH	A.R.	5 min.	260°C	540
	2700	52	LOW	A.R.	5 min.	260°C	580

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				
STATUTE			NAUTICAL			GAL.	STATUTE			NAUTICAL			STATUTE			NAUTICAL			STATUTE			NAUTICAL			GAL.	STATUTE			NAUTICAL	
SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						925																			925					
780			680			900	1260			1095			1530			1330			1665			1445			900	1860			1615	
705			615			800	1120			975			1360			1180			1480			1285			800	1640			1425	
615			535			700	980			850			1190			1030			1295			1025			700	1435			1245	
530			460			600	840			730			1020			885			1110			965			600	1230			1070	
440			380			500	700			610			850			740			925			805			500	1025			890	
350			305			400	560			485			680			590			740			640			400	820			710	
265			230			300	420			365			510			445			555			485			300	615			535	
175			150			200	280			245			340			295			370			320			200	410			355	
90			80			100	140			120			170			150			185			160			100	205			180	
MAXIMUM CONTINUOUS						PRESS	(1.4 STAT. (1.22 NAUT.) MI./GAL.)						(1.70 STAT. (1.48 NAUT.) MI./GAL.)						(1.85 STAT. (1.61 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE				
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
2400	F.T.	A.R.	185	320	278	25000																			25000						
2400	F.T.	A.R.	280	345	300	20000	2300	32.0	A.R.	235	330	286	2100	F.T.	A.R.	185	308	267	2100	29	A.L.	155	297	258	20000	2000	F.T.	A.L.	135	280	243
2400	42.0	A.R.	395	355	308	15000	2400	F.T.	A.R.	230	319	277	2150	F.T.	A.R.	175	300	260	2100	F.T.	A.L.	150	288	250	15000	2000	30.0	A.L.	135	274	238
2400	42.0	A.R.	380	330	286	10000	2150	F.T.	A.R.	220	305	265	2050	32.5	A.L.	170	291	253	2000	30.5	A.L.	150	277	240	10000	1850	27.0	A.L.	120	247	215
2400	42.0	A.R.	370	330	286	5000	2100	33.0	A.R.	205	285	247	2050	32.5	A.L.	160	271	235	1950	30.5	A.L.	140	258	224	5000	1850	27.5	A.L.	110	227	197
2400	42.0	A.R.	365	310	269	S.L.	2100	33.0	A.L.	155	267	232	2000	33	A.L.	150	250	217	1900	31.5	A.L.	125	235	204	S.L.	1800	28.0	A.L.	100	205	178

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 29000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 125 GAL.) TO FLY 1640 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 1850 RPM AND 27 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 56 (Sheet 3 of 3)—Flight Operation Instruction Chart

AAFMC-528
4-1-48

AIRCRAFT MODEL(S)
B-26B & B-26C
COMBAT AND FERRY CONFIGURATION
ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 38000 TO 35000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION
NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5 min.	260°C	500
EMERG.	2700	F.T.	LOW	A.R.	5 min.	260°C	520
MILITARY	2700	47	HIGH	A.R.	5 min.	260°C	540
POWER	2700	52	LOW	A.R.	5 min.	260°C	580

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	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		2035	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING(1)						2035		
1470	1275	1900	2125	1845	2585	2245			1900	3245	2815
1390	1205	1800	2000	1735	2430	2110			1800	3055	2650
1310	1135	1700	1875	1630	2280	1980			1700	2870	2490
1235	1070	1600	1750	1520	2125	1845			1600	2680	2325
1155	1005	1500	1625	1410	1975	1715			1500	2490	2160
1075	935	1400	1510	1310	1830	1590			1400	2310	2000
1000	870	1300	1395	1210	1685	1470			1300	2135	1855
920	800	1200	1280	1110	1540	1335			1200	1955	1695
840	730	1100	1165	1010	1395	1210			1100	1780	1555
765	665	1000	1050	910	1250	1170			1000	1600	1390
685	595	900	940	815	1120	975			900	1435	1245

MAXIMUM CONTINUOUS						PRESS	(1.0 STAT. (.87 NAUT.) MI./GAL.)						(1.2 STAT. (1.04 NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	42.0	A.R.	395	305	265	15000	2250	36.0	A.R.	275	275	239	2150	32.5	A.R.	210	251	218							15000	2050	F.T.	A.L.	145	228	198
2400	42.0	A.R.	380	290	252	10000	2300	F.T.	A.R.	285	283	246	2150	F.T.	A.R.	220	261	227							10000	2000	29.5	A.L.	145	222	193
2400	42.0	A.R.	370	290	252	5000	2250	36.5	A.R.	265	266	231	2150	33.5	A.R.	215	252	219							5000	1950	30.5	A.L.	140	213	185
2400	42.0	A.R.	365	278	241	S.L.	2250	37.5	A.R.	255	254	220	2100	34.0	A.R.	195	231	201							S.L.	1950	32.0	A.L.	135	205	178

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 38000 LB. GROSS WEIGHT WITH 1700 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 300 GAL.) TO FLY 2280 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2150 RPM AND 32.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-RICH, HIGH BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 35000#, THEN USE COLUMN III OF THE 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 57 (Sheet 1 of 4)—Flight Operation Instruction Chart

AAFMC-528 6-1-48

AIRCRAFT MODEL(S)
B-26B & B-26C
COMBAT AND FERRY CONFIGURATION
ENGINE(S): R-2800-27, OR-71, OR-79.

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 35000 TO 32000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION
NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5min.	260°C	500
EMERG.	2700	F.T.	LOW	A.R.	5min.	260°C	520
MILITARY	2700	47	HIGH	A.R.	5min.	260°C	540
POWER	2700	52	LOW	A.R.	5min.	260°C	580

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					
STATUTE		NAUTICAL	GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
			1800	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING(1)																		1800	3225		2800			
1330		1055	1700	2000		1740				2440		2120				2750		2400				1700	3040		2640			
1250		1085	1600	1875		1630				2285		1985				2580		2240				1600	2850		2475			
1170		1015	1500	1750		1520				2135		1855				2410		2090				1500	2660		2310			
1090		945	1400	1625		1410				1985		1720				2240		1945				1400	2470		2145			
1010		880	1300	1500		1300				1830		1590				2070		1795				1300	2280		1980			
935		810	1200	1375		1195				1680		1460				1900		1650				1200	2095		1820			
855		745	1100	1250		1085				1525		1325				1730		1500				1100	1905		1655			
775		670	1000	1125		930				1375		1195				1560		1355				1000	1715		1490			
700		610	900	1010		880				1230		1070				1400		1215				900	1535		1330			
620		540	800	895		775				1085		945				1235		1070				800	1330		1155			
540		470	700	780		680				940		815				1075		935				700	1150		1000			

MAXIMUM CONTINUOUS						PRESS	(1.10 STAT. (.96 NAUT.) MI./GAL.)						(1.30 STAT. (1.13 NAUT.) MI./GAL.)						(1.50 STAT. (1.3 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	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						
2400	F.T.	A.R.	280	293	254	20000	2350	F.T.	A.R.	260	289	251	2200	F.T.	A.R.	205	270	235	2100	F.T.	A.L.	160	255	221	20000						
2400	42.0	A.R.	395	311	270	15000	2200	34.5	A.R.	250	278	241	2150	31.5	A.R.	200	257	223	2100	32.5	A.L.	165	248	215	15000	2050	F.T.	A.L.	145	239	207
2400	42.0	A.R.	380	294	255	10000	2250	34.0	A.R.	255	283	246	2100	33.0	A.L.	185	261	227	2050	32.0	A.L.	165	253	220	10000	1950	29.0	A.L.	135	224	195
2400	42.0	A.R.	370	293	254	5000	2200	35.0	A.R.	235	262	228	2100	33.0	A.L.	170	243	211	2050	33.0	A.L.	160	240	208	5000	1900	31.0	A.L.	125	206	179
2400	42.0	A.R.	365	279	242	S.L.	2150	36.5	A.R.	220	249	216	2100	33.0	A.L.	155	225	195	2000	33.0	A.L.	145	222	193	S.L.	1800	30.0	A.L.	110	180	156

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 35000 LB. GROSS WEIGHT WITH 1000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 500 GAL.) TO FLY 775 STAT. AIRMILES AT 20000 FT. ALTITUDE MAINTAIN 2400 RPM AND F.T. IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-RICH, HIGH BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 32000#, THEN USE COLUMN I OF THE 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 57 (Sheet 2 of 4)—Flight Operation Instruction Chart

AAFMC-528
4-1-44

AIRCRAFT MODEL(S)
B-26B & B-26C
COMBAT AND FERRY CONFIGURATION
ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 32000 TO 29000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION

NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5 min.	260°C	500
EMERG.	2700	F.T.	LOW	A.R.	5 min.	260°C	520
MILITARY	2700	47	HIGH	A.R.	5 min.	260°C	540
POWER	2700	52	LOW	A.R.	5 min.	260°C	580

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					
STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
MAXIMUM CONTINUOUS						PRESS	(1.15 STAT. (1.0 NAUT.) MI./GAL.)						(1.45 STAT. (1.26 NAUT.) MI./GAL.)						(1.62 STAT. (1.41 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	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	2350	F.T.	A.R.	260	296	257	2150	F.T.	A.R.	190	272	236	2100	F.T.	A.L.	160	260	226	20000						
2400	42.0	A.R.	395	315	274	15000	2200	34.0	A.R.	245	283	246	2100	32.5	A.L.	170	260	226	2050	30.5	A.L.	155	248	215	15000	2000	F.T.	A.L.	135	238	207
2400	42.0	A.R.	380	298	259	10000	2200	34.0	A.R.	245	281	244	2100	33.0	A.L.	185	265	230	2000	30.5	A.L.	150	244	212	10000	1850	27.0	A.L.	120	212	184
2400	42.0	A.R.	370	297	258	5000	2200	34.5	A.R.	230	265	230	2100	33.0	A.L.	170	247	215	2000	31.5	A.L.	145	234	203	5000	1800	28.5	A.L.	110	198	172
2400	42.0	A.R.	365	282	245	S.L.	2150	36.5	A.R.	220	252	219	2100	33.0	A.L.	155	230	200	1950	32.0	A.L.	135	214	186	S.L.	1750	28.5	A.L.	100	177	154

SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]

FUEL U.S. GAL.	COLUMN II STATUTE	COLUMN II NAUTICAL	COLUMN III STATUTE	COLUMN III NAUTICAL	COLUMN IV STATUTE	COLUMN IV NAUTICAL	COLUMN V STATUTE	COLUMN V NAUTICAL
1360							2515	2180
1300	1575	1370	1960	1700	2170	1800	2400	2080
1200	1450	1260	1810	1570	2000	1735	2215	1925
1100	1325	1150	1655	1435	1830	1590	2025	1760
1000	1200	1040	1485	1290	1660	1440	1835	1595
900	1075	935	1335	1160	1490	1295	1645	1430
800	950	825	1180	1025	1320	1145	1455	1265
700	825	715	1030	895	1150	1000	1270	1100
600	700	610	875	760	980	850	1080	935
500	575	500	725	630	810	700	890	770
400	460	400	580	505	650	565	710	620
300	345	300	435	380	485	420	530	460

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 32000 LB. GROSS WEIGHT WITH 1200 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 160 GAL.) TO FLY 2000 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2000 RPM AND 31.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-LEAN, LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 29000#. THEN USE COLUMN IV OF THE 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

AAFMC-528 8-1-48

AIRCRAFT MODEL(S)
B-26B & B-26C
COMBAT AND FERRY CONFIGURATION
ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 29000 TO 26000 POUNDS

EXTERNAL LOAD ITEMS
ANY COMBINATION
NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5 min.	260°C	500
EMERG.	2700	F.T.	LOW	A.R.	5 min.	260°C	520
MILITARY	2700	47	HIGH	A.R.	5 min.	260°C	540
POWER	2700	52	LOW	A.R.	5 min.	260°C	580

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					
STATUTE			NAUTICAL			GAL.	STATUTE			NAUTICAL			STATUTE			NAUTICAL			STATUTE			NAUTICAL			GAL.	STATUTE			NAUTICAL		
SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																														
630			550			800	1000			870			1200			1040			1360			1180			800	1510			1310		
550			480			700	875			760			1050			910			1190			1035			700	1320			1145		
475			415			600	750			650			900			780			1020			885			600	1135			985		
395			345			500	625			545			750			650			850			740			500	950			825		
315			275			400	500			435			600			520			680			590			400	755			655		
235			205			300	375			325			450			390			510			445			300	565			490		
155			135			200	250			215			300			260			340			395			200	380			415		
80			70			100	125			185			150			130			170			150			100	190			165		

MAXIMUM CONTINUOUS						PRESS	(1.25 STAT. (1.09 NAUT.) MI./GAL.)						(1.52 STAT. (1.32 NAUT.) MI./GAL.)						(1.70 STAT. (1.47 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	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	307	268	20000	2250	F.T.	A.R.	230	295	256	2100	F.T.	A.R.	185	278	241	2100	F.T.	A.L.	160	270	234	20000	1900	F.T.	A.L.	120	228	198
2400	42.0	A.R.	395	318	276	15000	2200	32.0	A.R.	225	281	244	2100	32.5	A.L.	165	267	232	2000	29.5	A.L.	145	250	217	15000	1950	F.T.	A.L.	130	243	211
2400	42.0	A.R.	380	300	261	10000	2150	F.T.	A.R.	220	278	241	2100	32.0	A.L.	175	268	233	2000	30.0	A.L.	145	250	217	10000	1850	26.5	A.L.	115	217	188
2400	42.0	A.R.	370	299	260	5000	2100	33.5	A.R.	210	262	228	2100	33.0	A.L.	170	253	220	1950	30.5	A.L.	135	232	201	5000	1800	28.0	A.L.	105	203	176
2400	42.0	A.R.	365	284	247	S.L.	2100	35	A.R.	200	248	215	2100	33.0	A.L.	155	237	206	1900	32.0	A.L.	130	218	189	S.L.	1700	28.5	A.L.	95	180	156

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 29000 LB. GROSS WEIGHT WITH 500 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 625 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2200 RPM AND 32.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-RICH, HIGH BLOWER.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 57 (Sheet 4 of 4)—Flight Operation Instruction Chart

AAFMC-328 6-1-48

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

ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

SINGLE ENGINE OPERATION

CHART WEIGHT LIMITS: 32000 TO 29000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: ONE

LIMITS	RPM.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR	2700	F.T.	HIGH	A.R.	5 min.	260°C	250
EMERG.	2700	F.T.	LOW	A.R.	5 min.	260°C	260
MILITARY	2700	47	HIGH	A.R.	5 min.	260°C	270
POWER	2700	52	LOW	A.R.	5 min.	260°C	290

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]								
1500	1300	1300							1300	2175	1890
1385	1200	1200							1200	1990	1730
1265	1100	1100							1100	1805	1570
1150	1000	1000							1000	1620	1410
1035	900	900							900	1435	1245
915	795	800							800	1255	1090
800	695	700							700	1070	930
680	590	600							600	885	770
565	490	500							500	700	610
450	390	400							400	560	485
340	295	300							300	420	365

MAXIMUM CONTINUOUS						PRESS	(STAT. (NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	42.0	A.R.	195	220	191	20000																			20000						
						15000																			15000						
2400	42.0	A.R.	190	215	187	10000																			10000						
2400	42.0	A.R.	190	230	200	5000																			5000						
2400	42.0	A.R.	185	222	193	S.L.																			S.L.	2250	36.0	A.R.	135	190	165
																										2200	36.0	A.R.	120	175	153

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 32000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 1255 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2250 RPM AND 36.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO-RICH. LOW BLOWER UNTIL AIRPLANE WEIGHT DECREASES TO 29000#. THEN USE COLUMN V OF THE 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TESTS

Figure 58 (Sheet 1 of 2)—Flight Operation Instruction Chart

AAFMC-528 4-1-44

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

ENGINE(S): R-2800-27, OR-71, OR-79

FLIGHT OPERATION INSTRUCTION CHART

SINGLE ENGINE OPERATION

CHART WEIGHT LIMITS: 29000 TO 26000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: ONE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700 2700	F.T. F.T.	HIGH LOW	A.R. A.R.	5 min 5 min	260°C 260°C	250 260
MILITARY POWER	2700 2700	47 52	HIGH LOW	A.R. A.R.	5 min 5 min	260°C 260°C	270 290

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
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
1050 935 820	910 810 710	900 800 700							900 800 700	1655 1475 1290	1435 1280 1020
700 585 470	610 510 410	600 500 400							600 500 400	1105 920 740	960 800 640
350 235 115	305 205 100	300 200 100							300 200 100	550 370 185	480 320 160

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
2400	42.0	A.R.	195	228	198	25000 20000 15000																			25000 20000 15000						
2400	42.0	A.R.	190	225	195	10000																			10000						
2400	42.0	A.R.	190	235	204	5000																			5000						
2400	42.0	A.R.	185	225	195	S.L.																			S.L.	2100	34.5	A.L.	95	175	155
																										2100	35.0	A.L.	90	170	145

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 29000 LB. GROSS WEIGHT WITH 400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 150 GAL.) TO FLY 740 STAT. AIRMILES AT S.L. FT. ALTITUDE MAINTAIN 2100 RPM AND 35.0 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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
F.T. : FULL THROTTLE

DATA AS OF 1 May 47 BASED ON: FLIGHT TEST

Figure 58 (Sheet 2 of 2)—Flight Operation Instruction Chart