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dimensione ridotto

PB4Y-2 FLIGHT MANUAL
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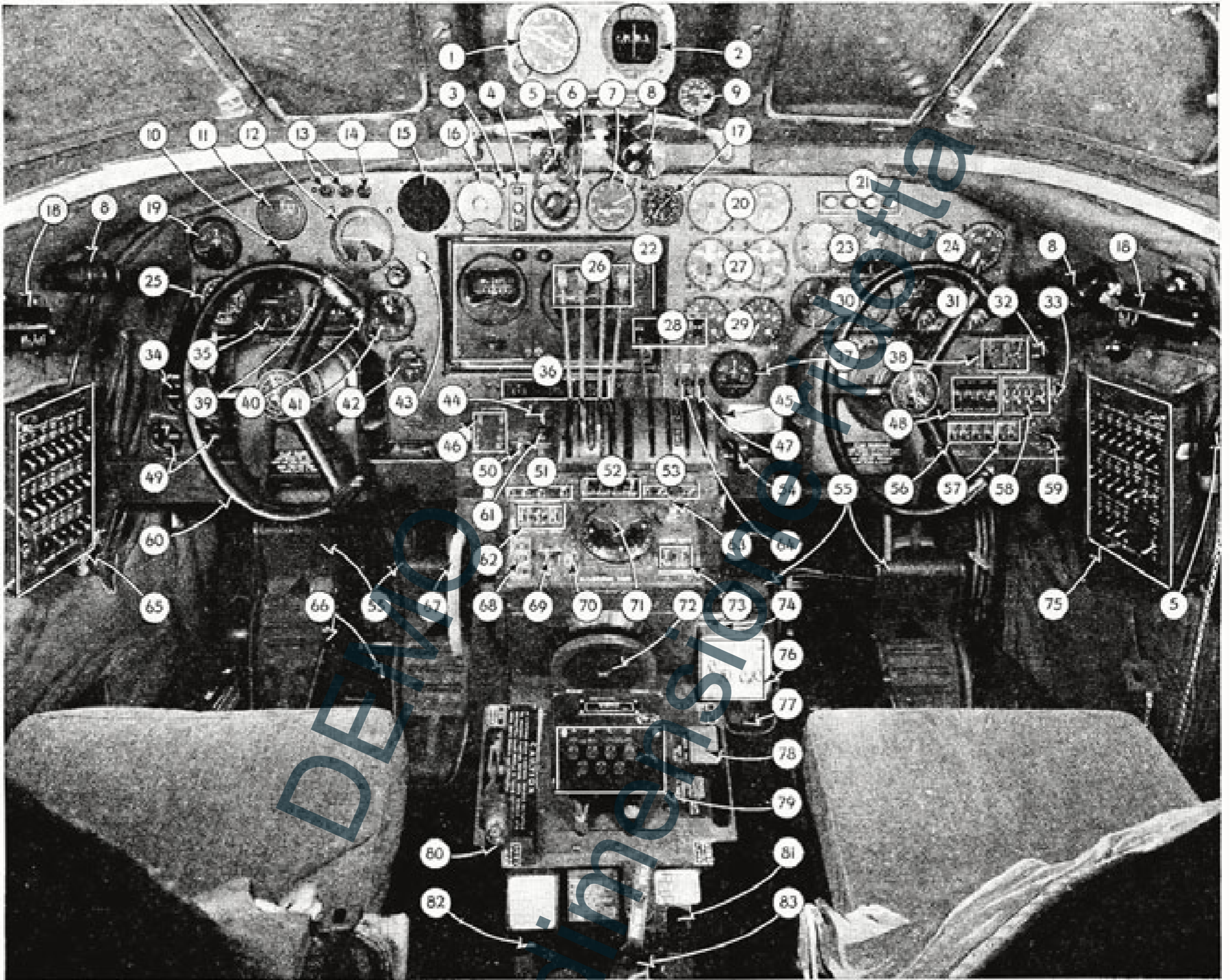
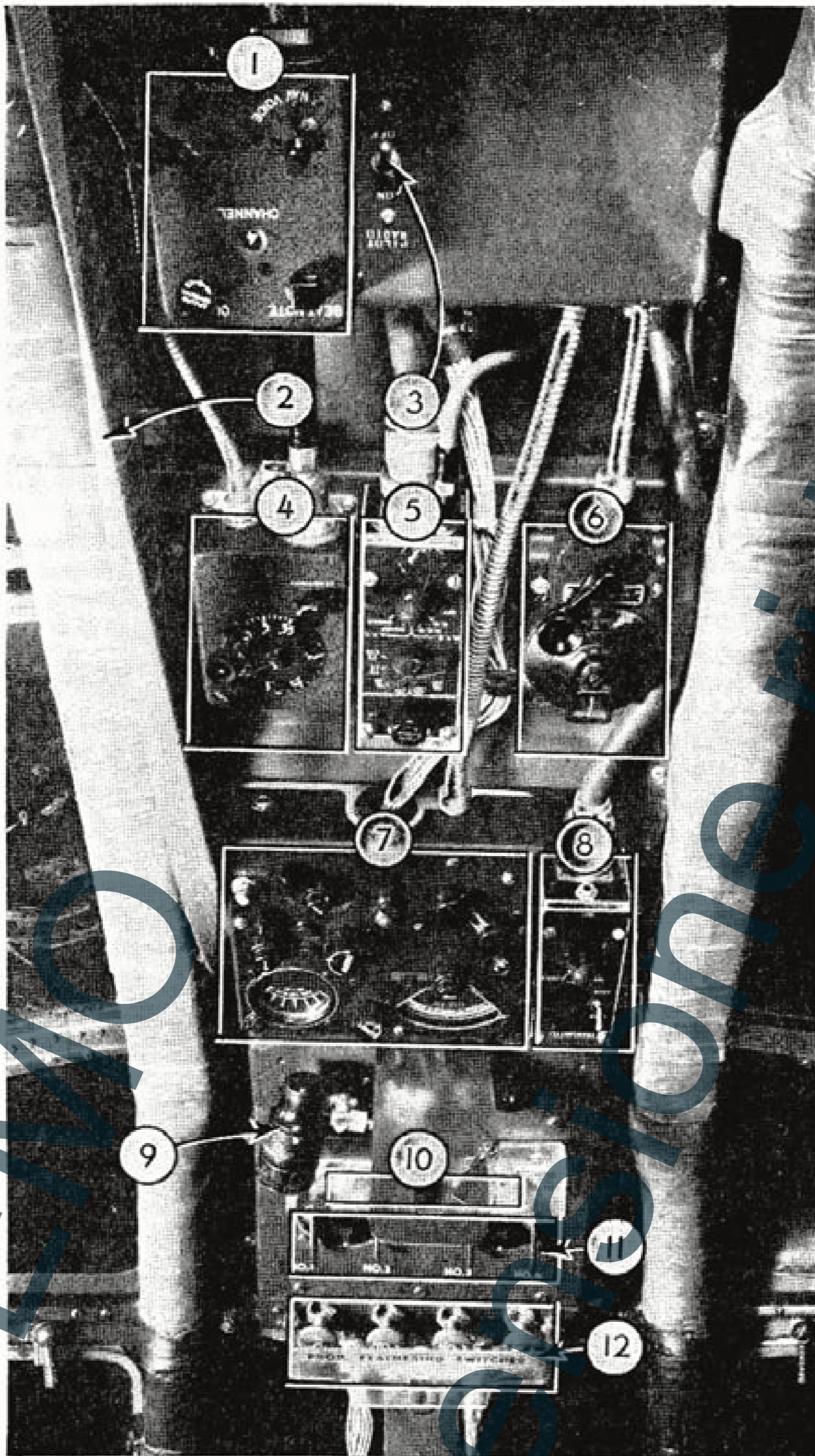


Figure 1—Location of Controls—Flight Compartment

LEGEND FOR FIGURE 1

- | | | |
|---|---|--|
| 1. Direction Indicator | 29. Fuel Flow Indicators | 56. Starter Switches |
| 2. Magnetic Compass | 30. Oil Temperature Indicators | 57. Primer Switches |
| 3. Radio Altimeter | 31. Oil Pressure Gauges | 58. Booster Pump Switches |
| 4. Radio Altimeter Indicating Lights | 32. Carburetor Air Control Handle | 59. Propeller Anti-Icing Switch |
| 5. Instrument Panel Light Rheostat Switch | 33. Bomb Bay Booster Pump Switch | 60. Pilot's Control Wheel |
| 6. Radio Altimeter Limit Switch | 34. Hydraulic System Pressure Gauge | 61. CO Indicator Warning Light |
| 7. Radio Compass | 35. Rate of Climb Indicator | 62. External Light Switches |
| 8. Ultra-Violet Instrument Panel Light | 36. Automatic Pilot Trim Indicators | 63. Automatic Pilot Control |
| 9. Free Air Temperature Indicator | 37. Pilot's Directional Indicator | 64. Landing Gear Position Indicator Lights |
| 10. Gyro Indicator Caging Control | 38. Oil Dilution Switches | 65. Pilot's Power Panel |
| 11. Gyro Indicator | 39. Turn and Bank Indicator | 66. Rudder Pedal Adjustment |
| 12. Gyro Horizon | 40. Microphone Button | 67. Elevator Tab Control |
| 13. Bomb Door Indicating Lights | 41. Altimeter | 68. Alarm Bell |
| 14. Bomb Release Indicating Light | 42. Flap Position Indicator | 69. A.C. Power Switch |
| 15. ZA Indicator | 43. Marker Beacon Indicator Light | 70. Pilot's Directional Indicator Switch |
| 16. Radio Altimeter | 44. Pitot Heat Switch | 71. Rubber Tab Control |
| 17. Clock | 45. Automatic Pilot Oil Pressure Gauge | 72. Aileron Tab Control |
| 18. Map Reading and Trouble Light | 46. Fast Feathering Pump Circuit Breaker
Reset | 73. Landing Light Switches |
| 19. Pilot's Directional Indicator | 47. A.S.G. Antenna Nacelle Position Indicator | 74. Recognition Light Keying Button |
| 20. Tachometers | 48. Cowl Flap Switches | 75. Copilot's Power Panel |
| 21. Propeller Limit Indicating Lights | 49. Brake Pressure Gauges | 76. Recognition Light Switches |
| 22. Automatic Pilot | 50. Hydraulic Booster Pump Switch | 77. Rudder Pedal |
| 23. Head Temperature Gauges | 51. Anti-Icing and Cabin Heat Switches | 78. Wing Flap Control Handle |
| 24. Fuel Pressure Gauges | 52. Propeller Governor Switches | 79. V.H.F. Control Head |
| 25. Air Speed Indicator | 53. Supercharger Switches | 80. Landing Gear Control Handle |
| 26. Throttle Levers | 54. Throttle Lock Control Knob | 81. Controls Lock |
| 27. Manifold Pressure Gauges | 55. Brake Pedals | 82. Parking Brake |
| 28. Mixture Control Levers | | 83. Emergency Bomb Release |



- | | |
|---|----------------------------------|
| 1. A.R.R.-2 Radio Receiver Control Head | 7. Radio Compass Control Head |
| 2. Control Lock Strap | 8. ATB Transmitter Control Head |
| 3. Pilot's Radio Power Master Switch | 9. Ultra-Violet Instrument Light |
| 4. ARC-5 Command Set Control Head | 10. Master Bar Switch |
| 5. ARB Command Receiver Control Head | 11. Ignition Switches |
| 6. ARB Command Receiver Control Head | 12. Fast Feathering Switches |

Figure 2—Overhead Controls

FLIGHT PROCEDURE

HOW TO FLY THE PB4Y-2 AIRPLANE

THE operation of any airplane, single or multi engine, requires certain functions to be performed in a definite sequence. This sequence is necessary either as a precaution against injury to personnel, or to prevent equipment damage which might be incurred by using an incorrect procedure, or to create a definite condition upon which a subsequent action depends.

Pilots and plane captains can learn the entire PB4Y-2 operation in detail by referring to the illustrated step-by-step guide herein as it applies to the operation of controls from the time the crew first approaches the airplane until it has returned to the field from a flight.

Fundamentally, the PB4Y-2 is not a stranger. Its prototype has demonstrated a tremendous capacity

to perform difficult missions. Changes in design and equipment location have occurred because of new demands on capacity.

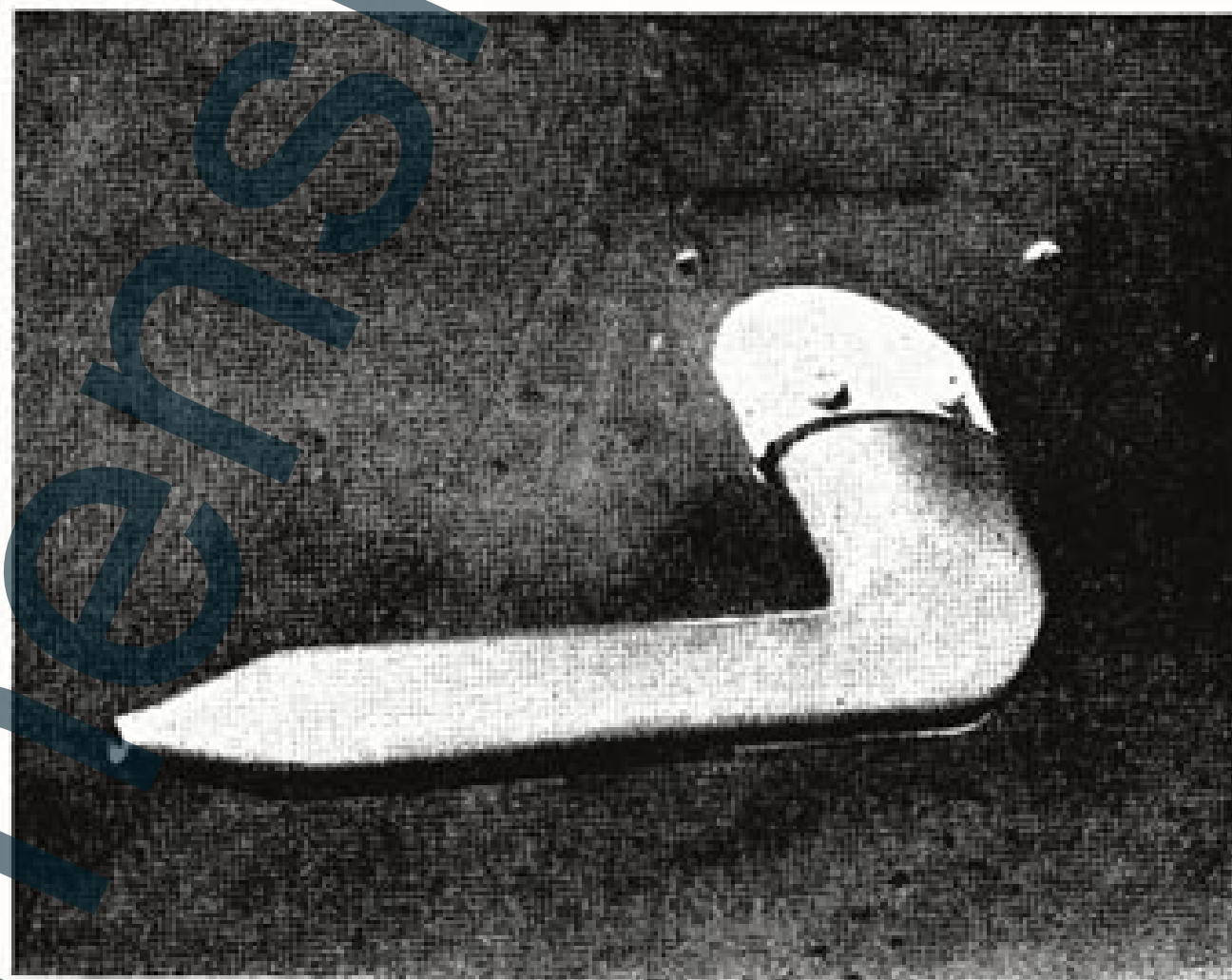
The various functional systems are described later in this manual. It is important that you **KNOW YOUR AIRPLANE**. A large bomber is a highly complicated piece of equipment, but a study of the functions of the several systems will clarify the doubt and mystery which accompany unfamiliarity. A little time devoted to fundamentals will pay amazing dividends—at a time when most needed. Competence inspires confidence, and, what is more important, may be the means of converting an impending misfortune into a successful outcome. *Use good judgment and common sense!*

BEFORE STARTING ENGINES

1---Pilot

CHECK PITOT COVER REMOVAL

Upon approaching the airplane the wise pilot makes certain that the cover on the pitot head has been removed. He knows that this cover cannot be removed in the air and that with it on the airspeed indicator is inoperative. An airplane of this size cannot be operated safely by guessing airspeeds.

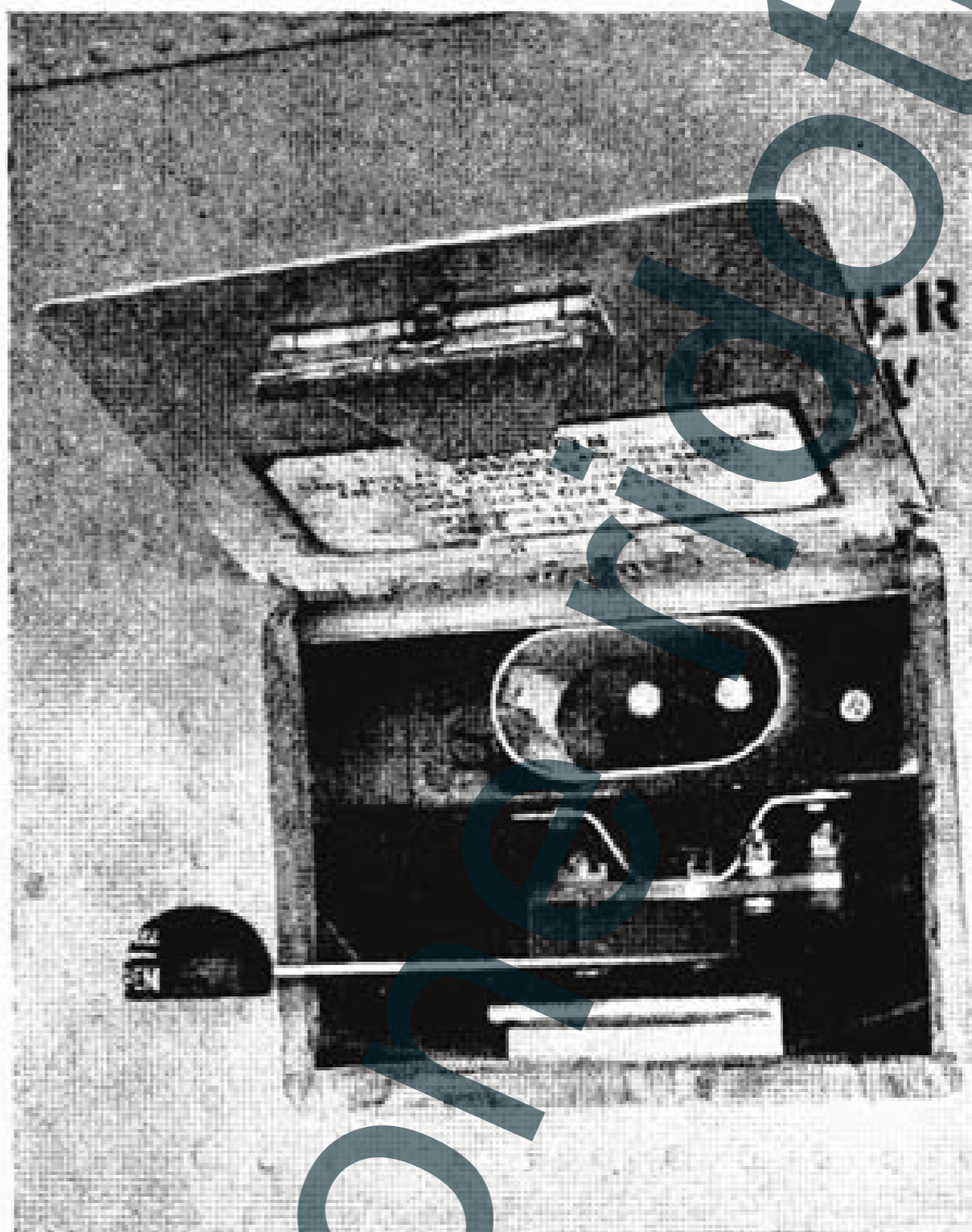
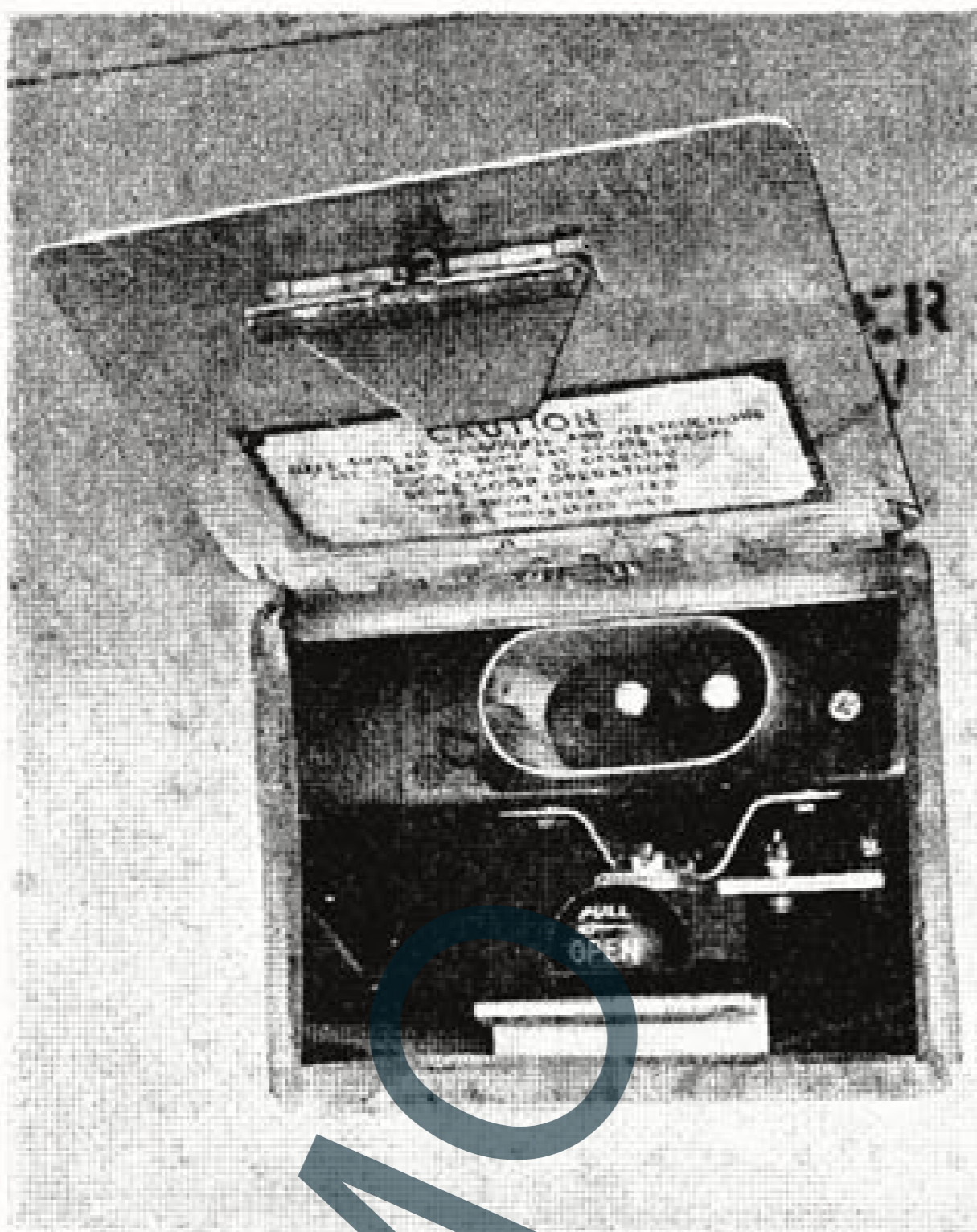


2—Plane Captain

OPEN BOMB BAY DOORS

The plane captain opens the bomb bay doors at a small access door on the right side of the fuselage. There is no lock—just push in on the small access disc to release the spring latch on the door. The

handle extension is first pulled outboard and then moved aft to operate the auxiliary bomb bay door valve. Retract the handle extension and the access door will close.



3—Pilot

FORM F WEIGHT AND BALANCE

It is the duty of the pilot to inspect the Form F and to determine if any malfunctions noted on the previous flight have been corrected. The weight and balance report should be inspected for approval at this time.

4—Plane Captain

PLANE CAPTAIN'S REPORT

When properly completed, this report should state the amount of fuel and oil aboard, the number of crew and parachutes aboard, and any discrepancies noted on preflight inspection.

With the ship open, pilots enter first and go to the flight compartment. The plane captain then enters.

PILOT'S CHECK LIST

BEFORE STARTING ENGINES

1. Pitot Cover—OFF
2. Form F, Weight and Balance
3. Engineer's Report
4. Master Bar and Ignition—OFF
5. Generators—OFF
6. Main Fuel Valves—TANK TO ENGINE
7. Bomb Bay Fuel Valve—OFF
8. Check Controls
9. Parking Brakes—SET
10. Wheel Chocks—Removed
11. Hydraulic Switch—OFF
12. Mixtures—IDLE CUT-OFF
13. Auto Pilot—OFF
14. Gyros Uncaged
15. Anti-Icer's, Wing Heat, and Prop.—OFF
16. Master Bar Switch—ON
17. Main Battery Switches One at a Time ON; Check Voltage, Polarity; turn OFF
18. Battery Cart ON, Check Voltage, Polarity
19. Hydraulic Switch—ON
20. Radar Housing—Retracted
21. Cowl Flaps—FULL OPEN
22. Props in INC. (High r.p.m.)
23. Superchargers to Low Blower
24. Carburetor Air Filter—As Required

STARTING ENGINES

1. Stand Fire Guard and call CLEAR
2. Ignition Switches—ON
3. A.C. Power—ON
4. Fuel Booster ON for Engine to be started, Check Fuel Pressure
5. Throttle Set; Accel. (20 Sec. Max.) Prime
6. Mesh Starter (30 Second Max.)
7. Mixture to Auto Rich when Engine Fires
8. Check Oil Pressure (30 Second Max.)
9. Booster—OFF; Check Engine Pump
10. Generators (of First Warm Engine)—ON if necessary to start on plane's batteries

BEFORE TAXIING

1. Check all Instruments
2. Remove Battery Cart
3. Check Brake Pressures
4. Check Vacuum Pressure
5. Generators ON

ENGINE RUN-UP

1. Throttles to 1500 r.p.m.
2. Exercise Propellers and Wing Flaps
3. Exercise Blowers One at a Time
1500 r.p.m.—Low to High
2300 r.p.m.—High to Low
Leave in Low Stage
4. Check Magnetos (Maximum r.p.m. drop of 75 at 2300)
5. Check Generators at 2300 r.p.m.

BEFORE TAKE-OFF

1. Doors and Hatches—CLOSED
2. Wing Flaps 20°
3. Gyros Uncaged and Set
4. Check Trim Tabs
5. Boosters—ON

6. Propellers (High r.p.m.)
7. Check Controls
8. Mixtures—Auto Rich
9. Cowl Flaps— $\frac{1}{2}$ Open

TAKE-OFF

1. Open Throttles; Limits 51" Hg
2800 r.p.m.
2. Nose Wheel in Alignment
3. Raise Gear; Brake Wheels

CLIMB

1. Propellers—2600 r.p.m.;
Manifold Pressure—42" Hg
2. Wing Flaps—Fully Retracted
3. Cowl Flaps—Max. Temp. 260° C.
4. Fuel Boosters—OFF When Not Required
5. Auxiliary Hydraulic Switch—OFF

BEFORE LANDING

1. Radio Call, Altimeter Setting
2. Crew Positions
3. Auto Pilot—OFF
4. Auxiliary Hydraulic Switch—ON
5. Brake Pressure—1050 p.s.i.
6. Cowl Flaps—CLOSED
7. Mixtures—AUTO RICH
8. Blowers—Low Position
9. Boosters—ON
10. Anti-Icer, Wing Heat and Prop.—OFF
11. Nose Wheel in Alignment
12. Landing Gear—UP
a. Check Kickout Pressure at 1050 to 1200 p.s.i.
13. Landing Gear—DOWN
a. Visual Locks
b. Light
14. Radar Housing—Retracted
15. Wing Flap Setting (Air speed not to exceed 135 knots)
16. Carburetor Air Filter—AS REQUIRED

FINAL APPROACH

1. Wing Flaps Full Down
2. Propellers to 2600 r.p.m.
3. Call out air speed

AFTER LANDING

1. Open Cowl Flaps
2. Raise Wing Flaps
3. Boosters—OFF

SECURING AIRPLANE

1. Align Nose Wheel
2. Mixtures—Idle Cut Off
3. Throttles—Advanced
4. Landing Gear Lever—Down
5. Place Wheel Chocks; Parking Brakes—OFF
6. Electrical Load Units—OFF
7. Generators—OFF
8. Battery and Master Emergency Switches—OFF
9. Neutralize Controls and Lock

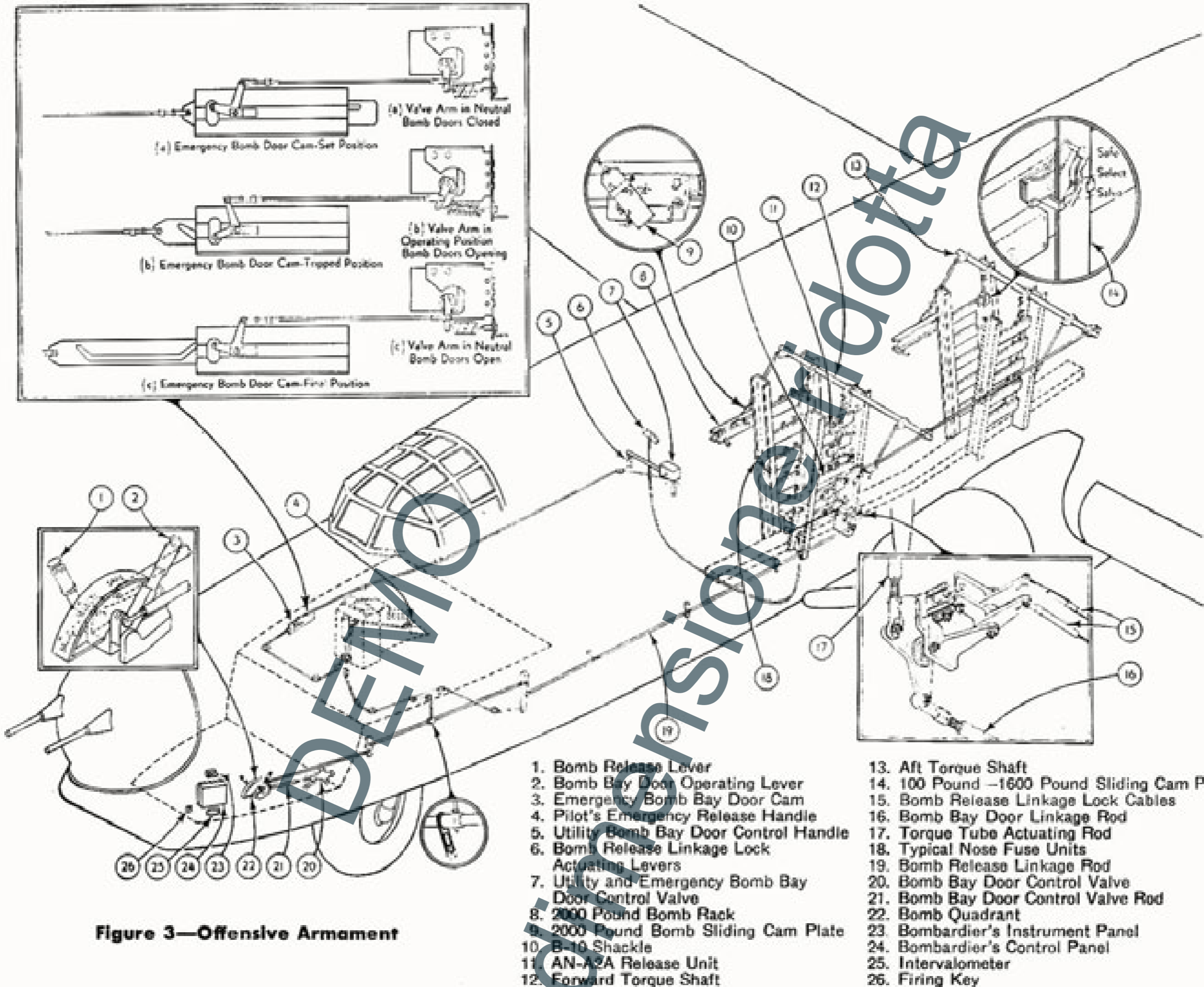


Figure 3—Offensive Armament

- | | |
|--|---|
| 1. Bomb Release Lever | 13. Aft Torque Shaft |
| 2. Bomb Bay Door Operating Lever | 14. 100 Pound -1600 Pound Sliding Cam Plate |
| 3. Emergency Bomb Bay Door Cam | 15. Bomb Release Linkage Lock Cables |
| 4. Pilot's Emergency Release Handle | 16. Bomb Bay Door Linkage Rod |
| 5. Utility Bomb Bay Door Control Handle | 17. Torque Tube Actuating Rod |
| 6. Bomb Release Linkage Lock Actuating Levers | 18. Typical Nose Fuse Units |
| 7. Utility and Emergency Bomb Bay Door Control Valve | 19. Bomb Release Linkage Rod |
| 8. 2000 Pound Bomb Rack | 20. Bomb Bay Door Control Valve |
| 9. 2000 Pound Bomb Sliding Cam Plate | 21. Bomb Bay Door Control Valve Rod |
| 10. B-10 Shackles | 22. Bomb Quadrant |
| 11. AN-A2A Release Unit | 23. Bombardier's Instrument Panel |
| 12. Forward Torque Shaft | 24. Bombardier's Control Panel |
| | 25. Intervalometer |
| | 26. Firing Key |

CHAPTER II ARMAMENT

THE PB4Y-2 airplane's primary mission is searching, reconnaissance, and tracking in sea areas where it may be exposed to fighter attack. A secondary mission includes antisubmarine patrol, mine laying, photography, and horizontal bombing.

The armament carried can be divided into two classifications: offensive and defensive.

OFFENSIVE ARMAMENT

The offensive armament system includes bombs which may range in weight from 100 lbs. to 2000 lbs. The control units are connected to the bomb rack installations by a series of rods in the mechanical release system by electrical wiring in the electrical release system. Bombs cannot be released

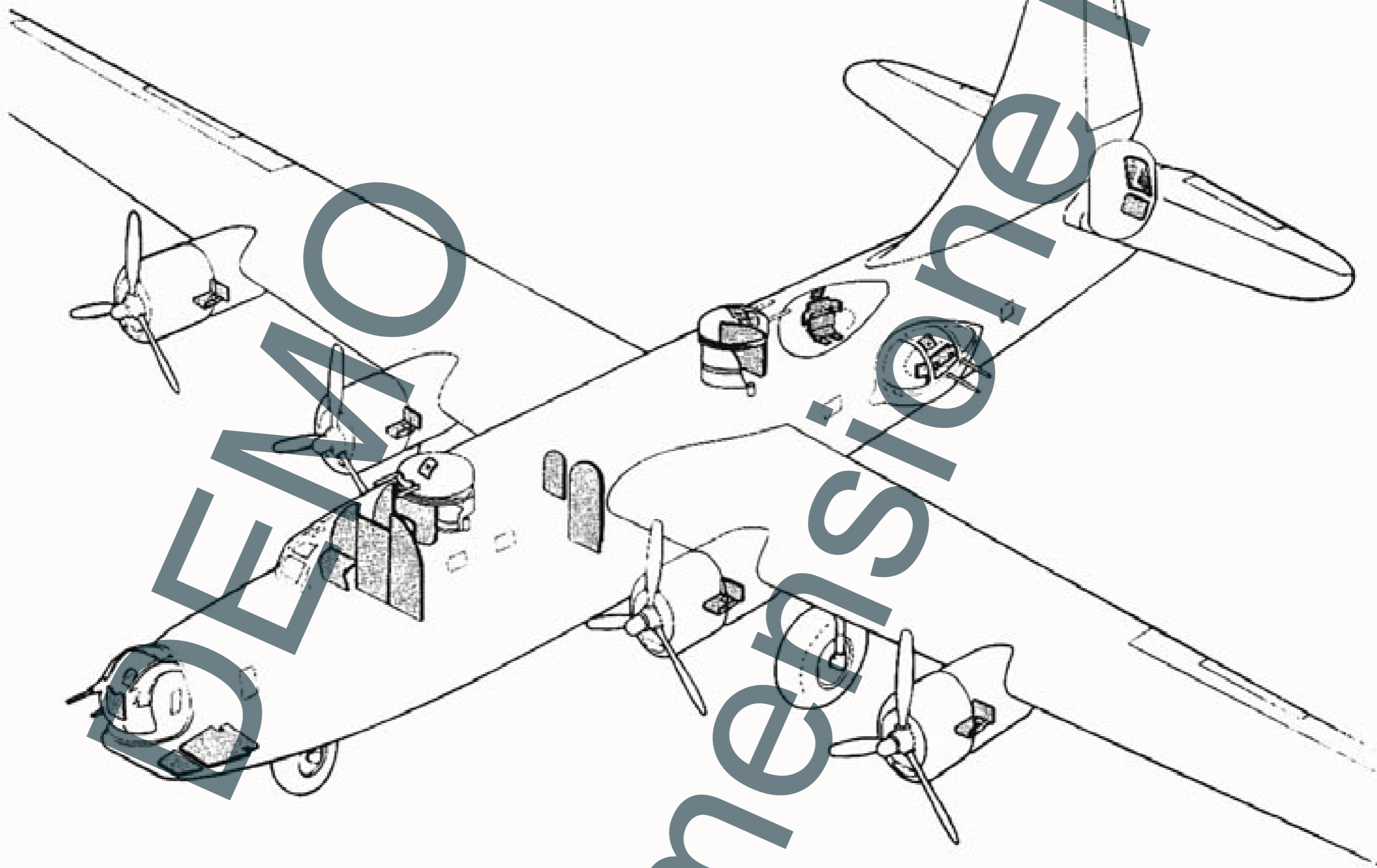


Figure 4—Location of Defensive Armor

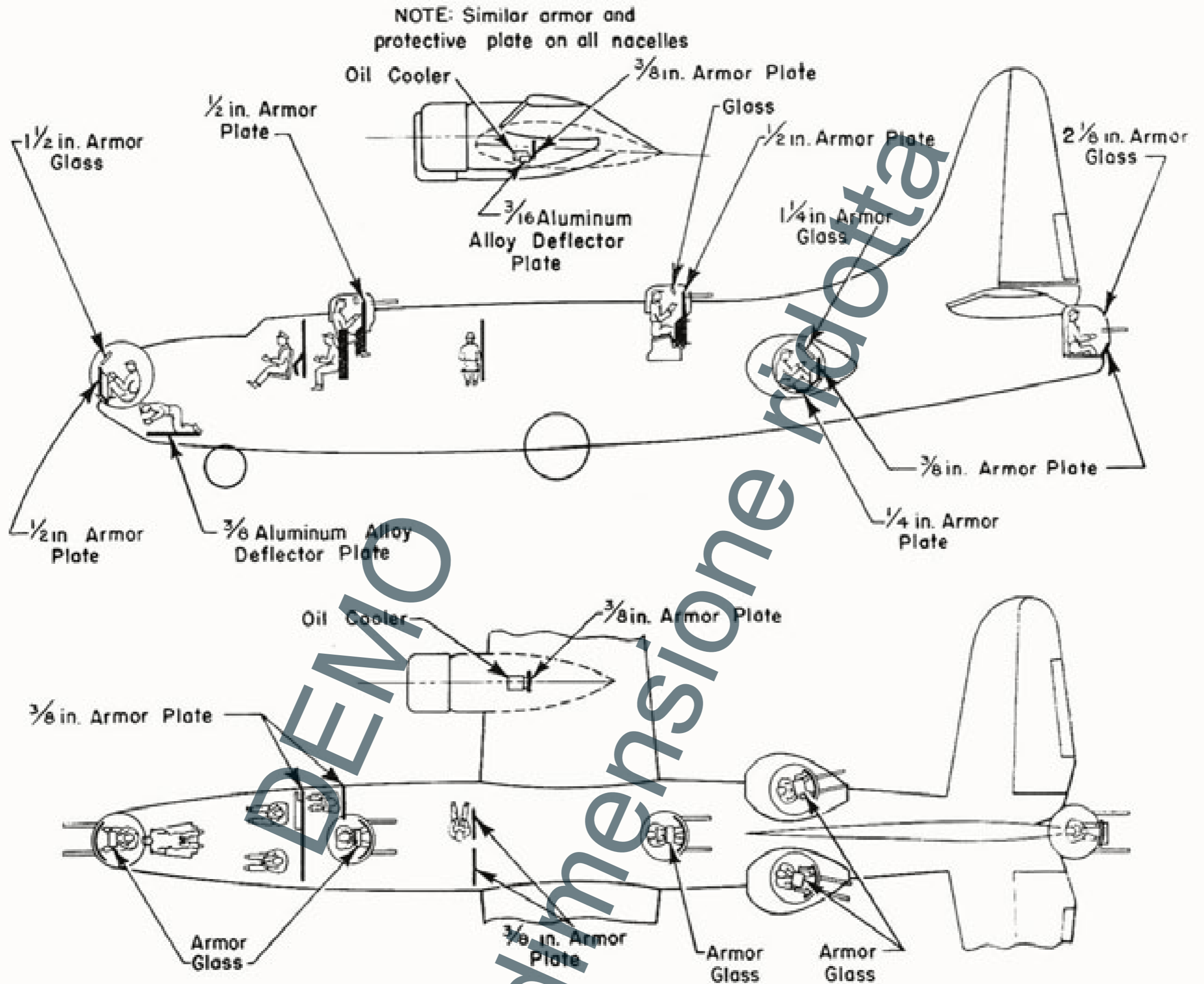


Figure 5—Defensive Armament—Angles of Armor Protection

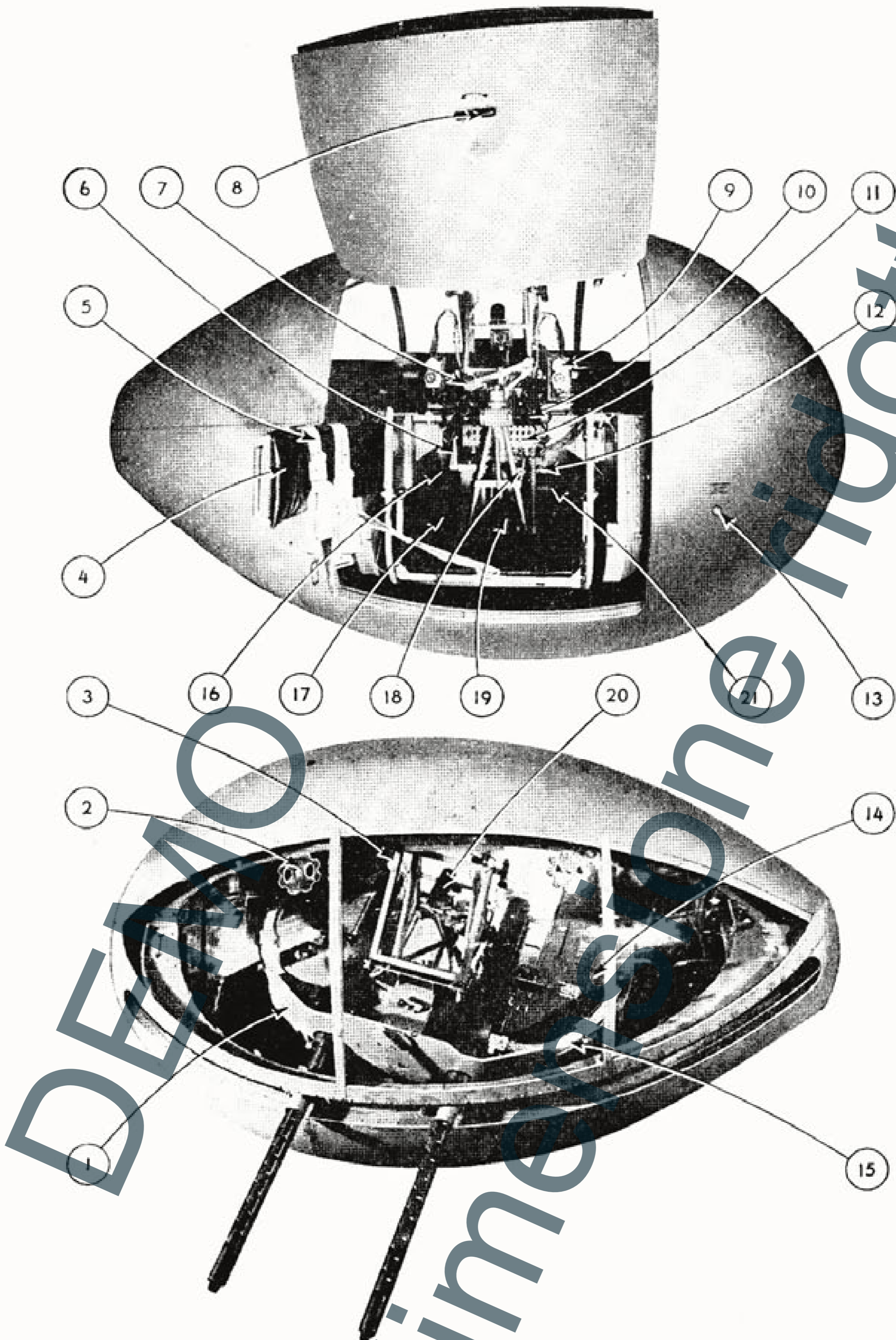
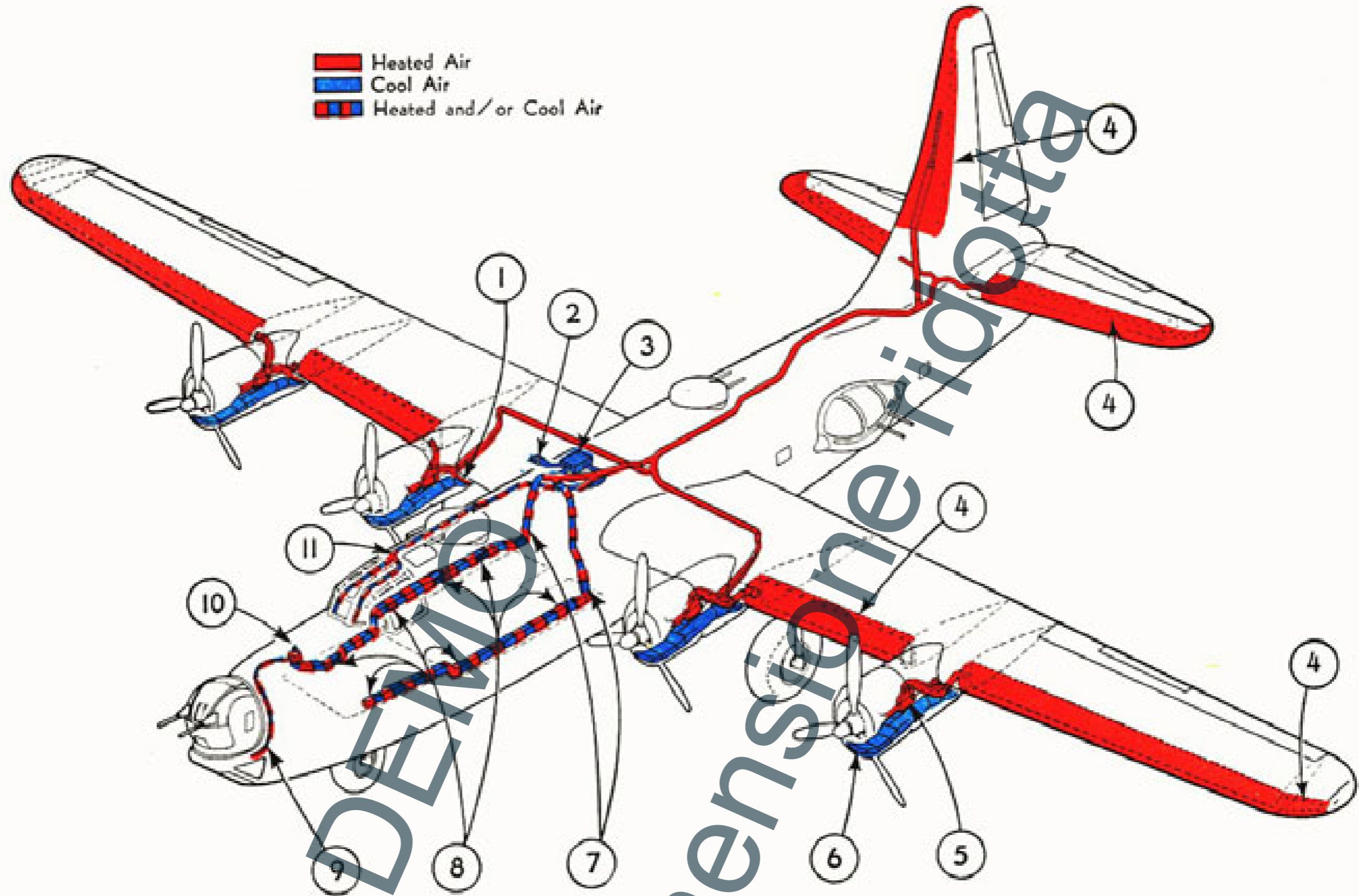


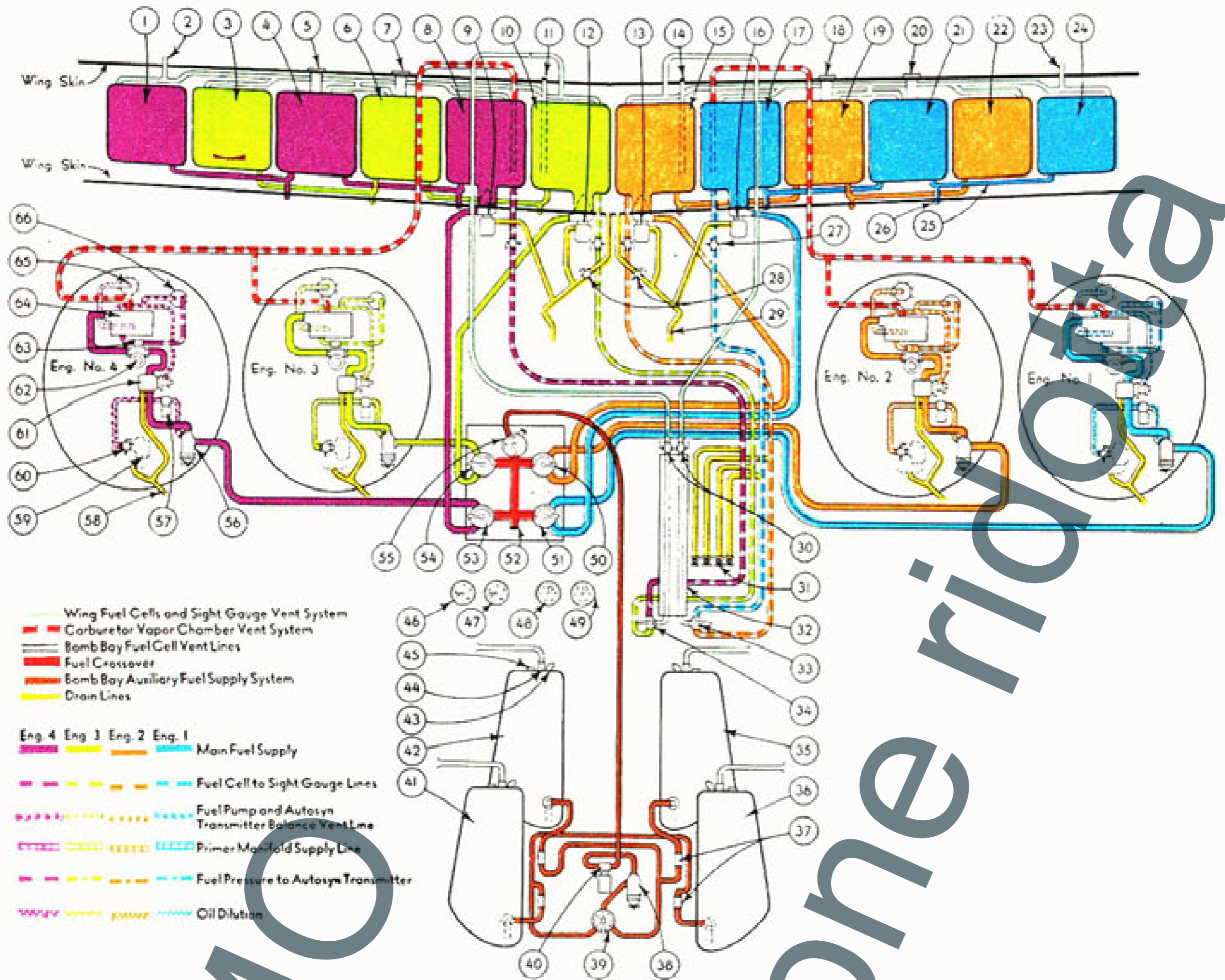
Figure 8—Erco Waist Turret



■ Heated Air
■ Cool Air
■■ Heated and/or Cool Air

- | | | | |
|------------------------------|-------------------|---------------------------------------|---------------------|
| 1. Heated Air Discharge Duct | 4. Vent Holes | 7. Cabin Heating and Ventilating Duct | 9. Defrosting Tube |
| 2. Air Scoop | 5. Heat Exchanger | 8. Adjustable Registers | 10. Control Valve |
| 3. Plenum Chamber | 6. Air Scoop | | 11. Defrosting Duct |

Figure 10—Heat Anti-icing, Cabin Heating, Ventilating and Windshield Defrosting Systems



1. Wing Fuel Cell No. 6, Right
2. Vent System Air Intake
3. Wing Fuel Cell No. 5, Right
4. Wing Fuel Cell No. 4, Right
5. Fuel Filler Cap, System No. 4
6. Wing Fuel Cell No. 3, Right
7. Fuel Filler Cap, System No. 3
8. Wing Fuel Cell No. 2, Right
9. Fuel Booster Pump, System No. 4
10. Wing Fuel Cell No. 1, Right
11. Fuel Cell Outlet Plug
12. Fuel Booster Pump, System No. 3
13. Fuel Booster Pump, System No. 2
14. Fuel Cell Outlet Plug
15. Wing Fuel Cell No. 1, Left
16. Fuel Booster Pump, System No. 1
17. Wing Fuel Cell No. 2, Left
18. Fuel Filler Cap, System No. 2
19. Wing Fuel Cell No. 3, Left
20. Fuel Filler Cap, System No. 1

21. Wing Fuel Cell No. 4, Left
 22. Wing Fuel Cell No. 5, Left
 23. Vent System Air Intake
 24. Wing Fuel Cell No. 6, Left
 25. Fuel Cell Interconnector Manifold
 26. Fuel Cell Manifold Drain
 27. Fuel Sight Gauge Shut-off Valves
 28. Wing Compartment Drain Valves
 29. Wing Compartment and Booster Pump Drain
 30. Sight Gauge Vent Line Shut-off Valves
 31. Sight Gauge System Drain Manifold
 32. Fuel Level Sight Gauge—Wing Fuel Tanks
 33. Fuel Sight Gauge Selector Valve—Tanks No. 1 and No. 2
 34. Fuel Sight Gauge Selector Valve—Tanks No. 3 and No. 4
 35. Aft, Left Hand Bomb Bay Fuel Cell
 36. Forward, Left Hand Bomb Bay Fuel Cell
 37. Automatic Disconnect Couplings
 38. Bomb Bay Fuel System Strainer
 39. Bomb Bay Fuel System Selector Valve
- Continued on page 57

Figure 12—Fuel System

The nacelle fuel system illustrated in figure 12 is factory installed on PB4Y-2 airplanes beginning with Bureau No. 59474. The nacelle fuel system for previous airplanes is illustrated in figure 13.

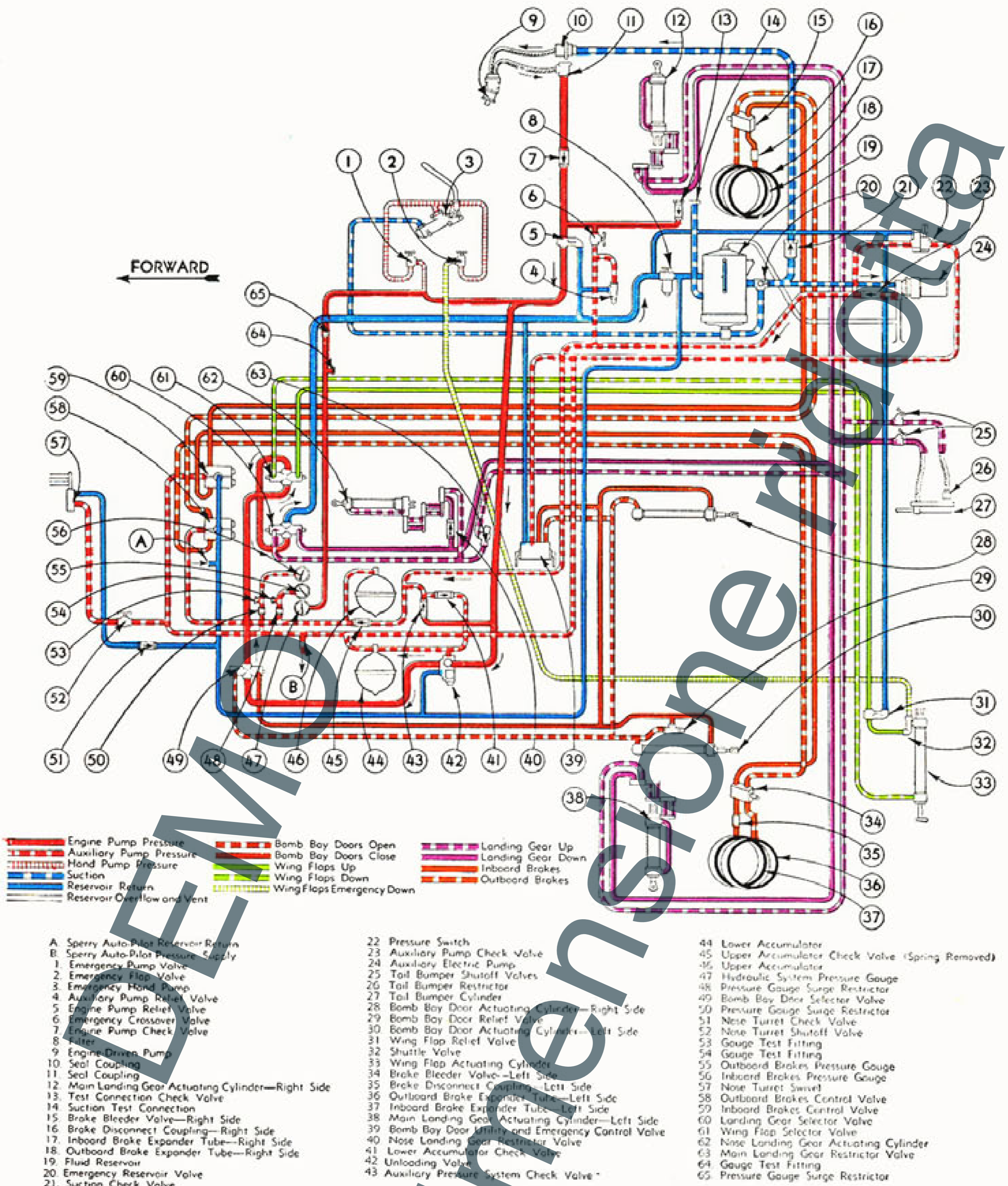


Figure 20—PB4Y-2 Hydraulic System

Oil Dilution

Oil dilution is accomplished by operating an electrically controlled solenoid which allows fuel under engine driven or booster pump pressure to enter the oil system at the Y drain valve. Whenever a cold start is anticipated, oil should be diluted before shutting down, on the preceding run. This can be accomplished by operating the oil dilution switches located on the copilot's instrument panel.

In the event the engine fuel pump is not operating and the fuel booster pump is not energized by its own circuit, a supply of fluid is assured by the oil dilute circuit energizing the fuel booster pump.

Dilute oil according to the following instructions:

1. Operate engine at 1000 to 1200 r.p.m.
2. Dilute each engine separately.
3. Maintain oil temperature below 50° C. (122° F.) and oil pressure above 15 p.s.i. (shut down engine to allow oil to cool to 40° C. (104° F.) and restart, if necessary, to maintain oil pressure).
4. Dilute engine oil as follows for ground temperatures shown:
 4° to -12° C. (40° to 10° F.)—Depress dilution switch for two minutes.
 -12° to -29° C. (10° to -20° F.)—Depress dilution switch for four minutes.

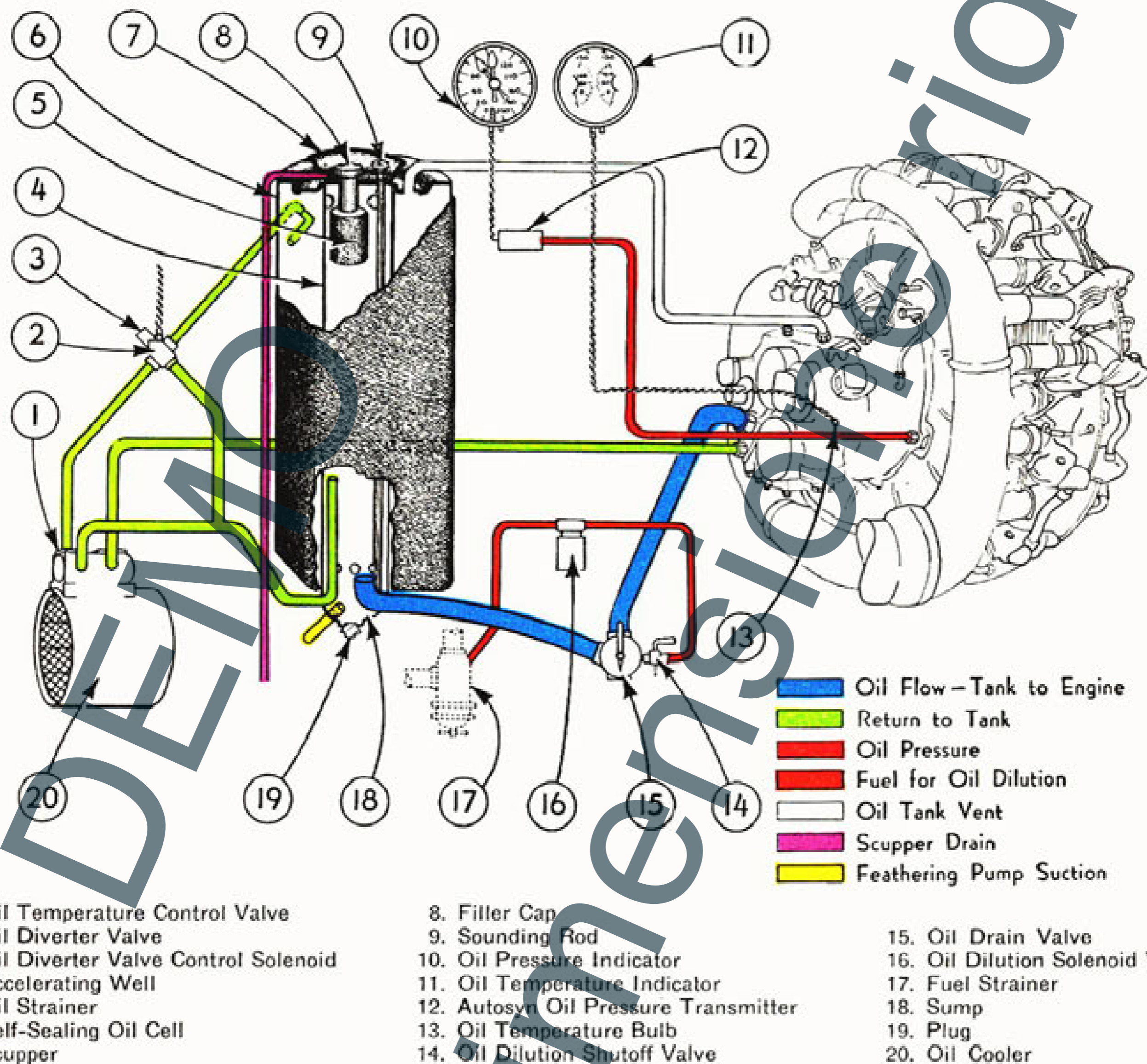


Figure 25—PB4Y-2 Oil Supply System