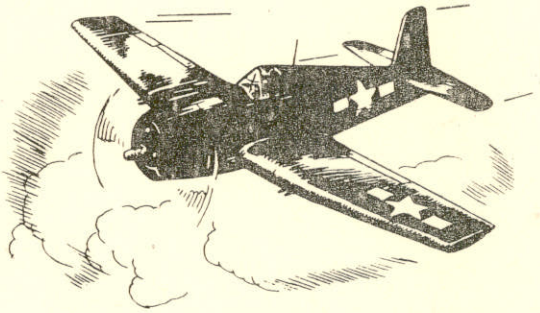
Pilot's Handbook

for

NAVY MODEL

F6F-3 • F6F-3N
F6F-5 • F6F-5N
Airplanes



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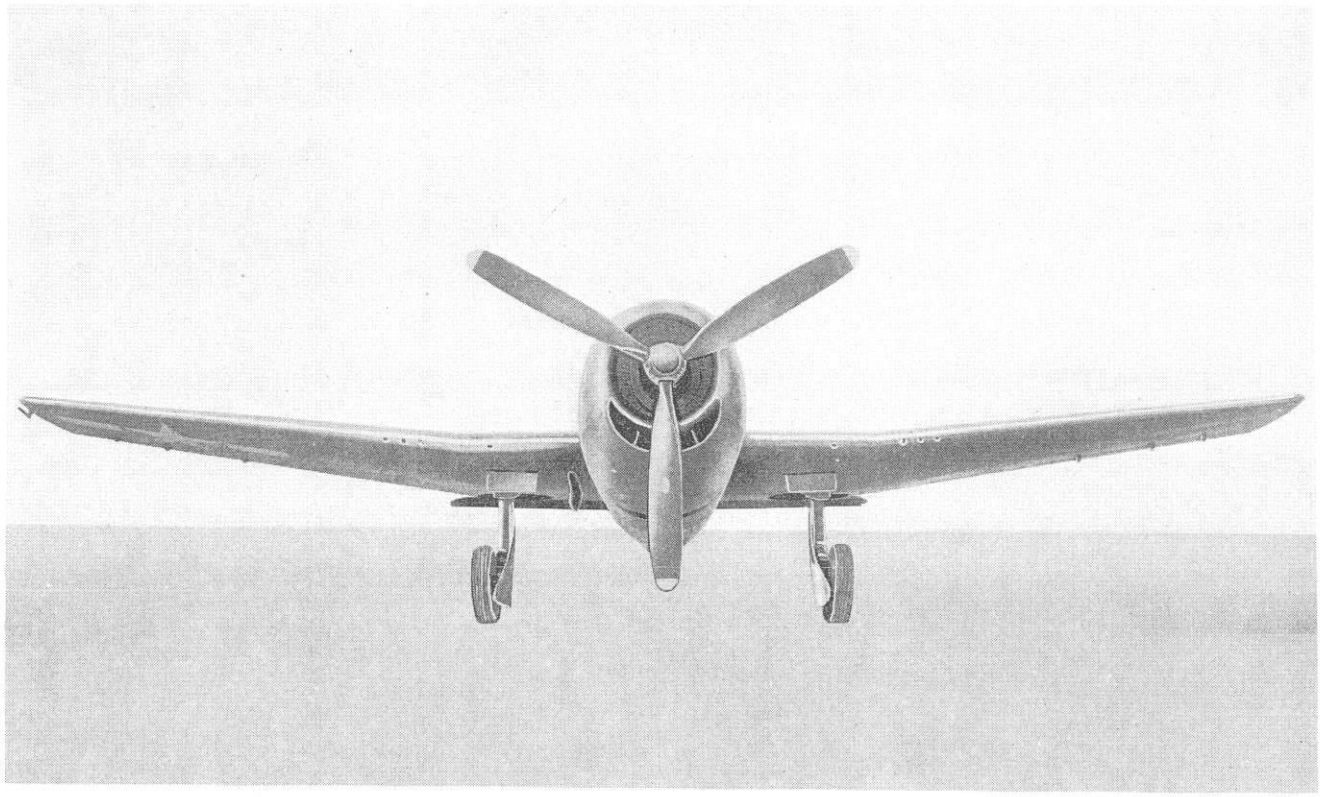


Figure 1-1. Airplane (F6F-5)—Front View

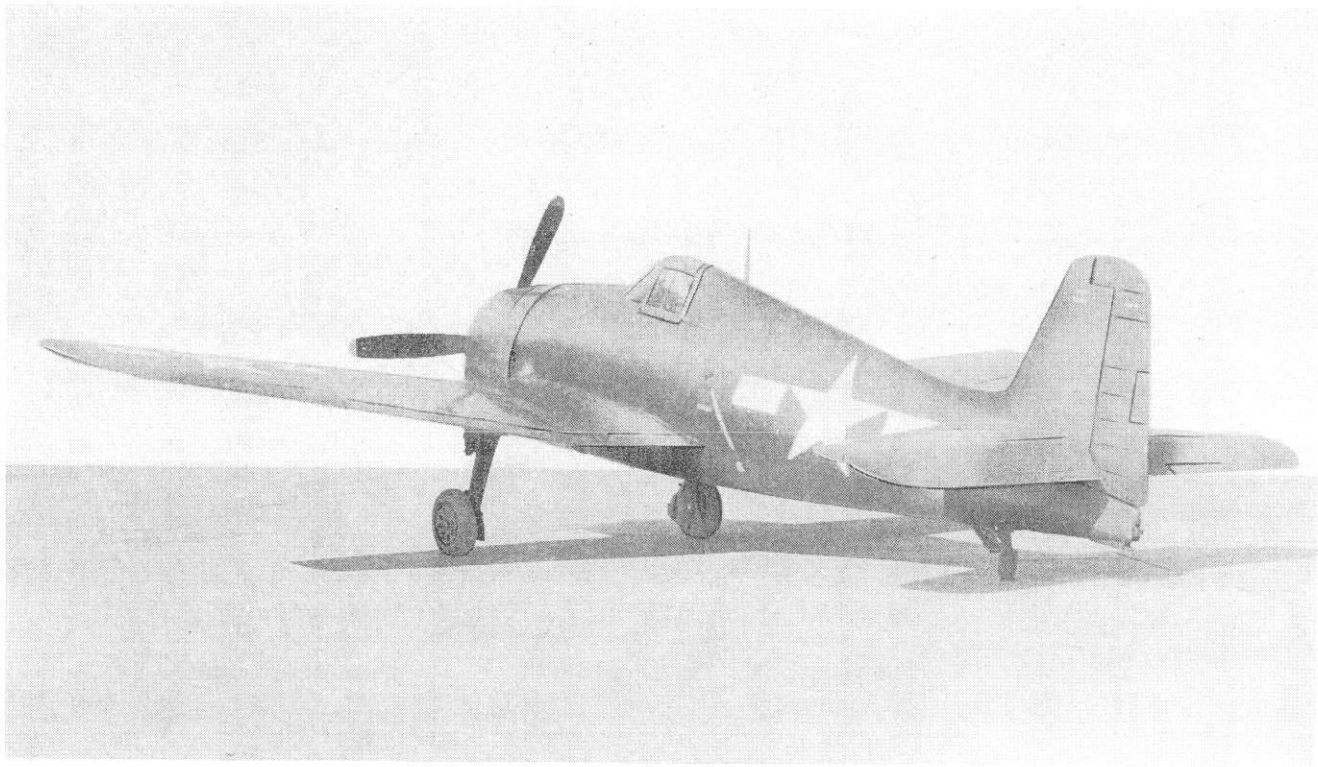
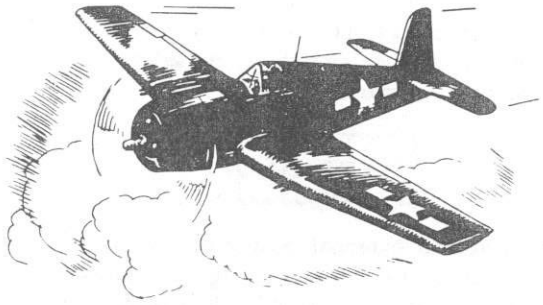


Figure 1-2. Airplane (F6F-5)—Three Quarter Left Rear View



SECTION I
DESCRIPTION

1-1. AIRPLANE.

1-2. The F6F-3, -3N, -5 and -5N airplane is a Class VF single engine, single place, folding low wing fighter. It is designed for either unassisted or catapult take-off from aircraft carriers. The landing gear, wing flaps, cowl flaps, intercooler and oil cooler shutters, wing hinge locking pins, and gun chargers are operated hydraulically. The arresting hook is operated electrically. The wings are folded and spread manually.

1-3. Two main fuel cells located left and right of the centerline in the wing center section have a capacity of 87.5 gallons each. A 75 gallon reserve tank is located in the fuselage under the cockpit floor. A 150 gallon droppable tank can be installed on the fuselage bomb rack and a 100 or 150 gallon droppable tank on each wing bomb rack.

1-4. The armament consists of six .50 cal. machine guns, three in each wing outer panel. Later model airplanes are designed to accommodate mixed batteries of guns, four .50 cal. machine guns and two 20 mm cannon. Two 1000 lb. bombs can be carried under the wing center section or a bomb or torpedo under the fuselage. When the airplane is operating with the torpedo or bomb under the fuselage, 100 gallon droppable fuel tanks can be carried under the wing center section. Three sets of rocket launchers are installed on the underside of each wing outer panel outboard of the guns.

Normal Weight	12480 lbs.
Span (Wings Spread)	42'10"
Span (Wings Folded)	16'2"
Fuselage (Height Overall)	14'5"
Fuselage (Length)	33'10"

1-5. POWER PLANT.

1-6. GENERAL. A Pratt and Whitney R-2800-10 or 10W two stage, two speed, supercharged engine drives a Hamilton Standard Hydromatic three-bladed propeller. The R-2800-10W engine is equipped with a water injection system.

1-7. POWER PLANT CONTROLS.

1-8. CONTROL QUADRANT. The engine control quadrant is located on the left hand cockpit shelf and includes the throttle lever, supercharger lever, mixture lever, and propeller governor lever with vernier handwheel.

1-9. THROTTLE LEVER. Handle with the microphone switch button on the top.

a. Move AFT to "CLOSED".

b. Move FORWARD to "OPEN".

1-10. SUPERCHARGER LEVER. Handle marked (SC) in the center of the control quadrant.

a. Move FORWARD for "NEUTRAL".

b. Move to CENTER for "LOW".

c. Move AFT for "HIGH".

1-11. MIXTURE LEVER. Handle marked (M) on inboard side of control quadrant.

a. Move FULL AFT to "IDLE CUT-OFF".

b. Move FORWARD to "AUTO LEAN" and "AUTO RICH".

c. "FULL RICH" position has been rendered inoperative.

1-12. PROPELLER GOVERNOR LEVER AND VERNIER HANDWHEEL. The propeller pitch is controlled hydraulically by a governor unit located on the nose section of the engine. The propeller governor control lever, marked (P), is located on the aft end of

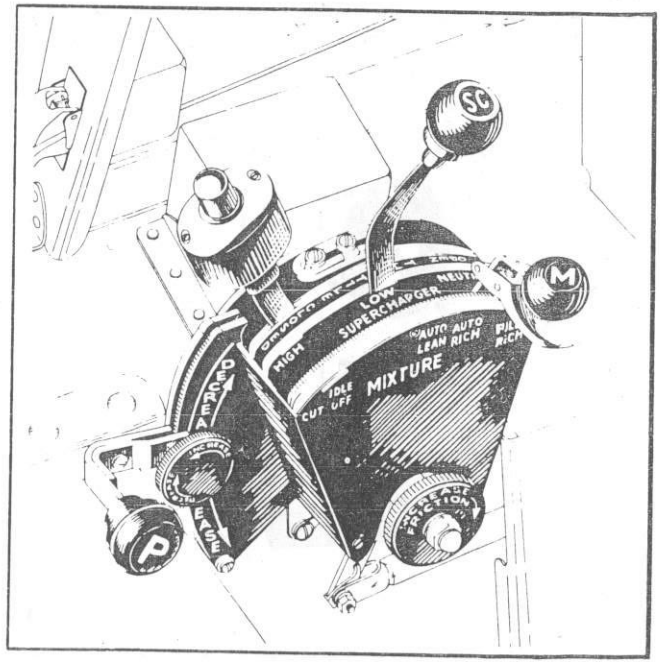


Figure 1-3. Engine Control Quadrant

the engine control quadrant. The vernier handwheel for fine pitch adjustment is located at the base of the governor lever.

a. Move lever UP to "DECREASE RPM" (Increase Pitch).

b. Move lever DOWN to "INCREASE RPM" (Decrease Pitch).

c. Rotate vernier handwheel CLOCKWISE to "DECREASE RPM".

d. Rotate vernier handwheel COUNTERCLOCKWISE to "INCREASE RPM".

1-13. FRICTION ADJUSTMENT KNOB. On inboard side at the base of the control quadrant (for throttle and propeller levers only).

a. Rotate CLOCKWISE to "INCREASE FRICTION".

b. Rotate COUNTERCLOCKWISE to "DECREASE FRICTION."

1-14. IGNITION SWITCH. The ignition switch is mounted to the left of the main instrument panel. The switch has four positions: "OFF", "R", "L", and "BOTH".

1-15. PRIMER AND STARTER CONTROLS. The primer and starter control switches are located at the forward end of the electrical distribution panel. Early model airplanes are equipped with cartridge starters and later models with direct cranking electric units.

1-16. PRIMER SWITCH. The primer switch is located at the forward end of the electrical distribution panel adjacent to the starter switch. The battery switch, also on this panel, must be "ON" to prime and start the engine.

a. Move primer switch INBOARD to "OFF".

b. Move primer switch OUTBOARD to "ON".

1-17. STARTER SWITCH. The starter switch is located aft of the primer switch. Lift safety cap and hold switch "ON" to start engine.

CAUTION

With either an external power source or the battery being used for starting, continuous cranking should not exceed 60 seconds. If the engine does not start, open the starter switch and allow the starter to cool for at least one minute. If the engine fails to start after a few attempts, check engine. Since the induction vibrator (booster coil) is designed for 60 seconds operation, continuous use of the starter with a cold engine may burn out the induction vibrator.

1-18. COWL FLAPS CONTROL. The spring loaded cowl flap hydraulic control lever is located on the left hand cockpit shelf.

a. Move lever FORWARD to "OPEN".

b. Move lever to CENTER to "NEUTRAL" (Lock).

c. Move lever AFT to "CLOSE".

1-19. The cowl flaps, can be operated by the hydraulic hand pump by turning the hand pump selector valve to "ENGINE FLAPS", when the engine-driven hydraulic pump is not operating. See Section IV.

1-20. CARBURETOR AIR CONTROL. The two position carburetor air control (auxiliary stage) "T" handle is located on the left hand side of the instrument panel.

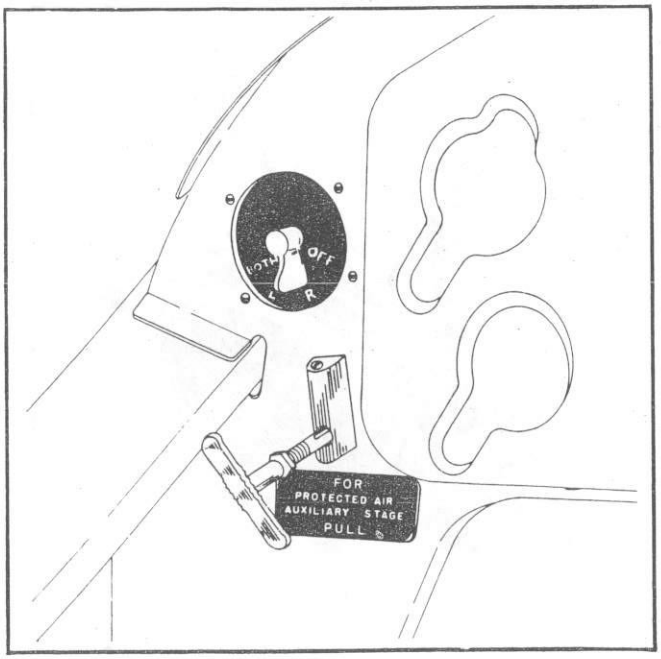


Figure 1-4. Ignition Switch and Carburetor Air Control

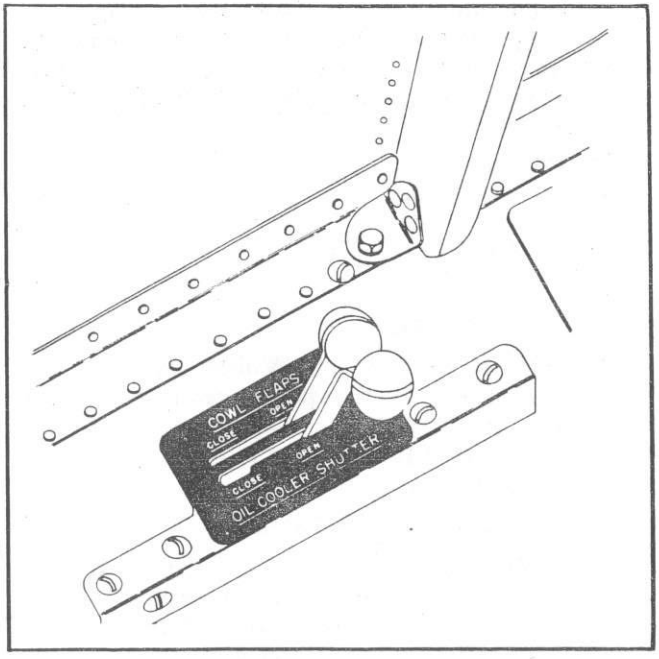


Figure 1-5. Cowl Flaps Control

a. Push "T" handle FULL FORWARD for "DIRECT".

b. Pull "T" handle FULL AFT for "PROTECTED AIR AUXILIARY STAGE".

1-21. This handle regulates only air coming from the auxiliary stage inlet duct located in the lower section of the nose spinning, and does not affect main stage air which is taken from the accessory compartment when operating in neutral blower. The primary function of the control is to prevent direct ramming air from entering the auxiliary stage when carburetor air filters are being used to filter main stage air while operating in neutral blower.

1-22. The combination of the Stromberg Injection Carburetor and the Pratt & Whitney blower-throat, fuel discharge nozzle and spinner, with the absence of distribution vanes in the blower throat, makes the Double Wasp two stage engine unusually free from icing tendencies. However, ice can form in the induction system ahead of the auxiliary stage when the outside air temperature is below 0°C (32°F) and free moisture is present. Under icing conditions mentioned above, the air control should be shifted to "PROTECTED AIR".

CAUTION

Do not use an intermediate position of this control.

1-23. WATER INJECTION SYSTEM CONTROL. The WEP switch which actuates the water injection fluid pump is located on the left hand shelf just outboard of the engine control quadrant. Early model airplanes are equipped with a quantity gage for the fluid tank (16 gallons), located to the right of the main instrument panel and connected electrically to a float type transmitter in the tank.

a. Move WEP switch AFT to "OFF".

b. Move WEP switch FORWARD to "ON".

1-24. Before the water injection system is put into operation by moving the throttle FULL FORWARD, the switch must be placed in the "ON" position so that the water pump will be allowed to build up the required pressure necessary for the operation of the system.

1-25. WATER REGULATOR. A water regulator is located in the engine accessory compartment. A line extends from the regulator to the carburetor spray nozzle unit. An electrical solenoid valve on the regulator controls the flow of water through this line. A micro-switch located on the engine control box controls the valve. A micro-switch is actuated by a tab attached to the throttle control rod. This tab can be adjusted, thereby allowing control over the water regulator at various manifold pressures.

1-26. MANIFOLD PRESSURE SWITCH. Airplane BUAERO #10801 and subsequent, are equipped with an electric manifold pressure switch connected in parallel with the engine throttle micro-switch. This manifold pressure switch closes the water regulator solenoid valve circuit when the manifold pressure reaches 54 inches and opens the circuit when pressure falls below 51 inches; thus allowing a gradual reduction in horsepower when the throttle is moved AFT from the "FULL FORWARD" position.

Note

In the F6F-3 and -3N when the water pump switch is turned "ON", it immediately begins the operation of the pump but the water regulator solenoid valve does not open until the throttle is FULL FORWARD. However, in the F6F-5 and -5N the water pump switch and the throttle actuating switch are wired in series. When the water pump switch is turned "ON", the water pump will not operate until the actuating switch is closed by moving the throttle FULL FORWARD, then operation of the water pump and opening of the water regulator solenoid are effected.

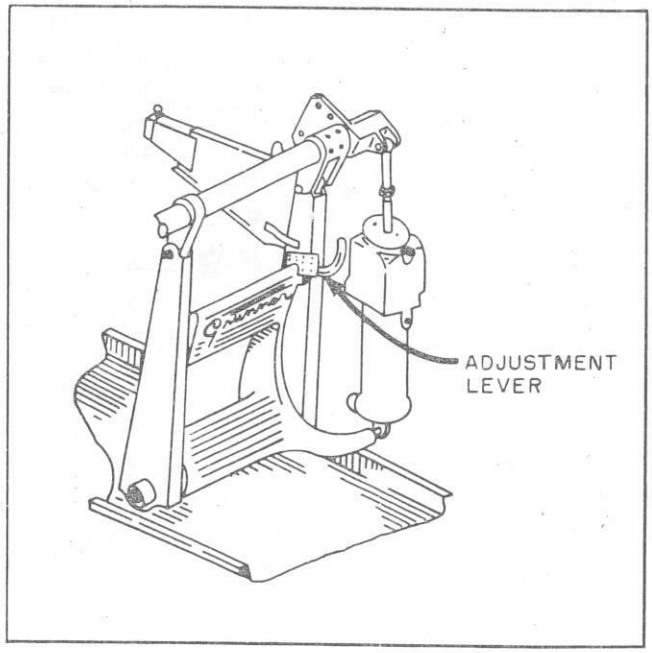


Figure 1-6. Rudder Pedal

1-27. FLIGHT CONTROLS.

1-28. AILERON AND ELEVATOR CONTROLS. A conventional type control stick, equipped with pistol type grip and provided with a gun trigger and bomb release button, is installed. Dual elevator control cables are installed to reduce the possibility of elevator control being lost due to single bullet impact.

1-29. RUDDER AND BRAKE CONTROL PEDALS.

1-30. PEDAL ADJUSTMENT. The standard underhung rudder and brake pedals are adjustable to four positions by a toe adjustment lever on each outer pedal arm. To adjust the pedals, press the levers

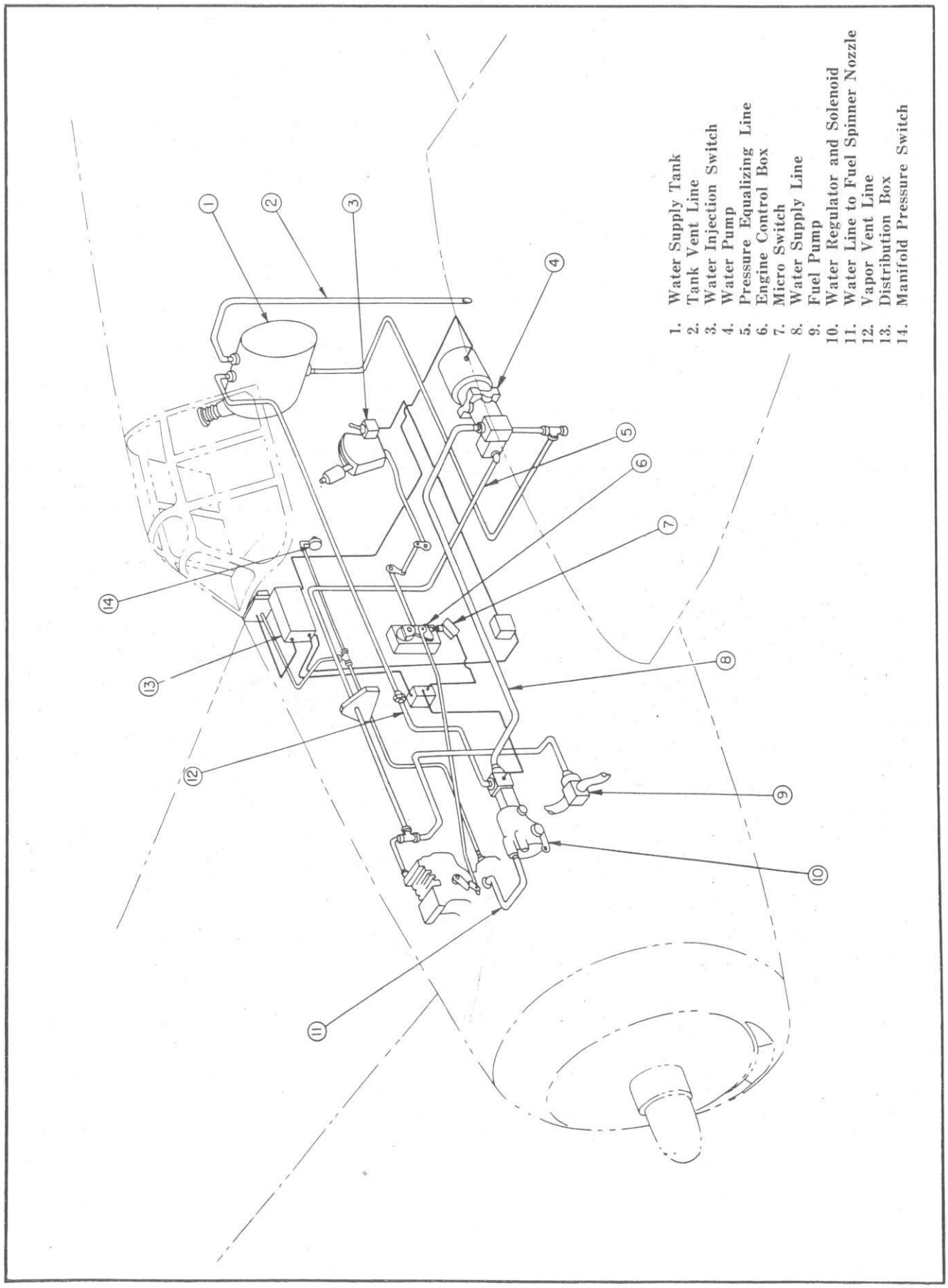


Figure 1-7. Water Injection System Diagram (F6F-5 and -5N)

down and push the pedals full forward with the toes; then put the toes under the pedals and pull aft one notch at a time to the desired position. Make certain that each pedal has ratcheted past the same number of notches.

1-31. Pedal motion is transmitted to the rudder by cables running aft to a bellcrank which drives two push-pull rods which deliver force differentially to the rudder quadrant.

1-32. AILERON, ELEVATOR AND RUDDER TRIM TAB CONTROLS. The trim tab controls for the left aileron, elevators and rudder are mounted as a unit on the left hand side of the cockpit. The operation of the controls is standard.

Note

On the F6F-5 and -5N airplanes, the ailerons are equipped with spring tabs which lighten the control forces. Their operation is completely automatic. The left aileron tab also operates as a trim tab in the conventional manner.

1-33. AILERON TAB CONTROL (knob on forward side of unit). Rotate knob CLOCKWISE for "LEFT WING DOWN"—Rotate knob COUNTERCLOCKWISE for "RIGHT WING DOWN".

1-34. ELEVATOR TAB CONTROL (wheel on inboard side of unit). Rotate wheel CLOCKWISE for "NOSE DOWN"—Rotate wheel COUNTERCLOCKWISE for "NOSE UP".

1-35. RUDDER TAB CONTROL (knob on top of unit). Rotate knob CLOCKWISE for "NOSE RIGHT"

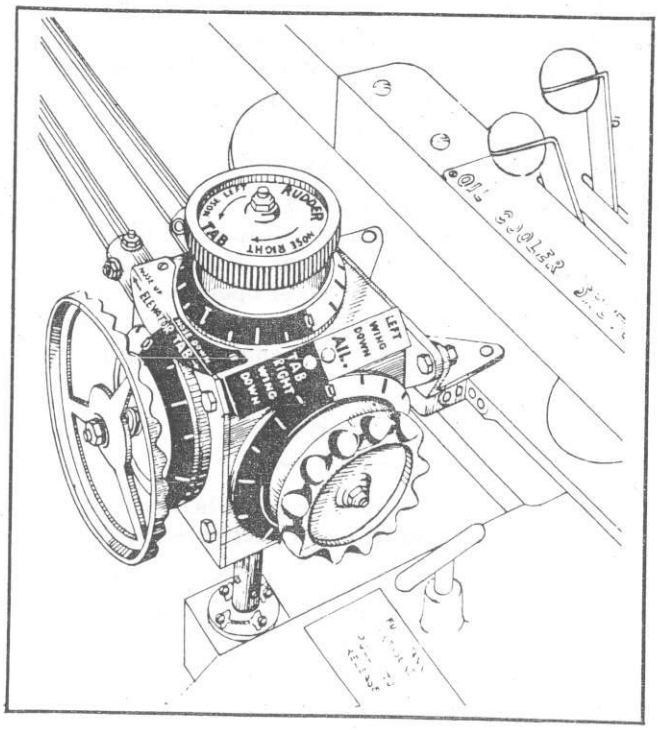


Figure 1-8. Tab Control Wheels

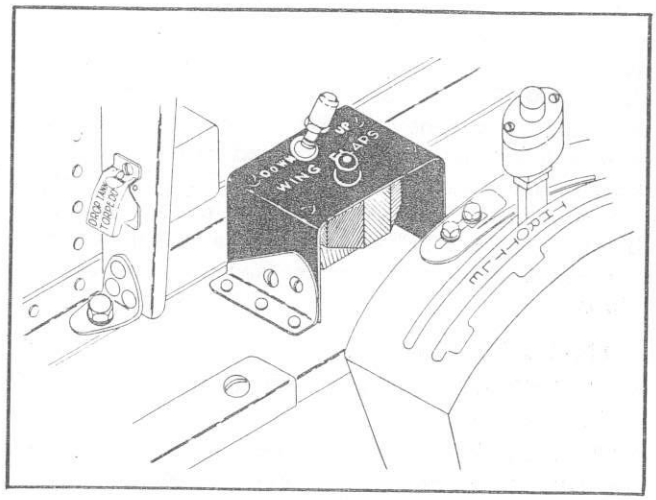


Figure 1-9. Wing Flaps Control

—Rotate knob COUNTERCLOCKWISE for "NOSE LEFT".

1-36. WING FLAPS CONTROL.

1-37. GENERAL. The wing flaps, of the low drag type, are actuated by four hydraulic cylinders controlled from the cockpit. Two cylinders are installed in each wing, one inboard and one outboard. A combined landing gear and wing flap position indicator is installed outboard of the landing gear control lever.

1-38. OPERATION. During normal conditions the wing flap hydraulic control valve, which actuates the four cylinders, is operated by an electric servo motor controlled by a toggle switch on the left hand shelf adjacent to the engine control quadrant. (For emergency operation of the wing flaps, refer to section IV.)

a. Move switch FORWARD for "FLAPS UP".

b. Move switch AFT for "FLAPS DOWN"

CAUTION

The flaps are held down only by hydraulic pressure remaining constant—there is no other lock. In an emergency when loss of pressure or leaks are indicated in the system, lower the flaps last. If the flaps are lowered first, the force of the airstream may overcome the pressure and force them up, and there may not be enough fluid remaining in the system to lower them again.

1-39. OPERATION OF COMPRESSION SPRING UNITS. Four blow-up spring units, one connected to each flap, are installed to allow the flaps to "blow-up" with increasing airspeed. These spring units automatically control the flap angle in flight when the flaps are "DOWN". The spring units are not controllable from the cockpit and are entirely independent of the hydraulic cylinders. The range of flap angle is from 50° at 93 knots IAS to 15° at 150 knots IAS.

1-40. AUTOMATIC CONTROL SYSTEM. The wing flaps will not come down at speeds in excess of 170 knots IAS even though the electric control switch is in the "DOWN" position. An airspeed switch, located in the wing center section, is connected to the pitot lines in parallel with the airspeed indicator. The airspeed switch automatically retracts the flaps when the speed exceeds 170 knots. If the wing flap switch is left on the "DOWN" position, the airspeed switch will extend flaps again when the speed drops below 170 knots.

1-41. FUEL SYSTEM.

1-42. FUEL SPECIFICATION. Grade 100/130, Spec. AN-F-28.

1-43. FUEL CELLS. There are two main fuel cells located left and right of the center line of the wing center section. A reserve fuel cell is located in the fuselage under the cockpit floor. A 150 gallon droppable tank can be carried under the belly of the airplane, and two 100 or 150 gallon droppable tanks under the wing center section bomb racks.

1-44. TANK CAPACITIES.

	Gallons		
Left Main	87.5	U.S.	73 Imp.
Right Main	87.5	U.S.	73 Imp.
Reserve	75	U.S.	62 Imp.
Fuselage Droppable	150	U.S.	125 Imp.
Wing Droppable	100	U.S.	83 Imp.
	or 150	U.S.	125 Imp.

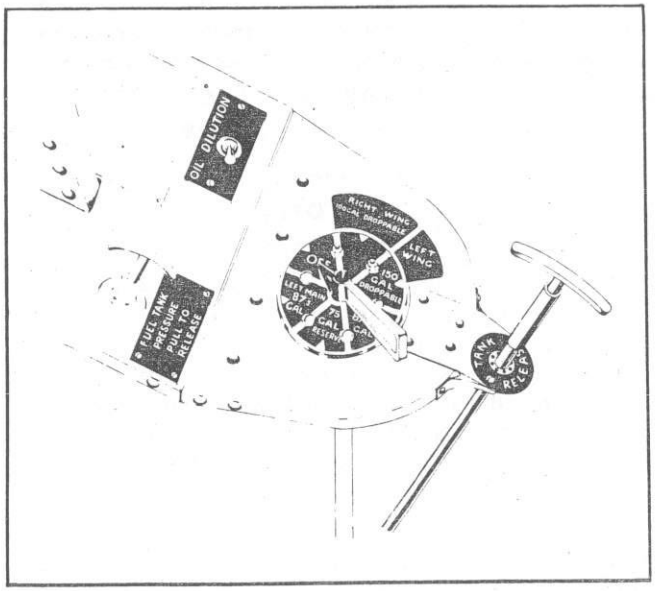


Figure 1-10. Fuel Control Panel

1-45. FUEL SYSTEM CONTROLS.

1-46 FUEL QUANTITY GAGE. The fuel quantity gage is located on the lower right hand instrument panel. Three individual pointers register for right and left main and reserve tanks.

Note

The vapor return line from the carburetor leads to the right main tank, and discharges approximately one to two gallons of fuel per hour.

1-47. RESERVE TANK WARNING LIGHT. Early model airplanes are equipped with a fuel warning light for the reserve tank located on the fuel control panel. The light will glow when the reserve tank contains 50 gals. or less. The fuel quantity gage should then be closely watched and the airplane flown at the most economical speed tactically feasible. Leave lamp on BRIGHT—Rotate to DIM.

1-48. TANK SELECTOR VALVE. The fuel tank selector valve dial and handle are located on the center of the fuel control panel.

a. Rotate pointer to FORWARD-OUTBOARD position for "OFF".

b. Rotate pointer to AFT-OUTBOARD position for "LEFT MAIN".

c. Rotate pointer to AFT position for "RESERVE".

d. Rotate pointer to AFT-INBOARD position for "RIGHT MAIN".

e. Rotate pointer to FORWARD-INBOARD position for "150 GAL. DROPPABLE" or "LEFT WING".

f. Rotate pointer to forward position for "RIGHT WING DROPPABLE".

Note

Be certain pointer is centered on selected tank.

1-49. AUXILIARY ELECTRIC FUEL PUMP SWITCH. The auxiliary (emergency) fuel pump switch is located on the left hand side of the cockpit forward of the engine control quadrant.

a. Move switch FORWARD to "ON".

b. Move switch AFT to "OFF".

1-50. Operate the auxiliary pump to build up initial pressure to start the engine, to maintain fuel pressure at altitude, during critical periods of fuel system operation such as take-off, high power operation, landing, fuel transfer system operation, changing tanks, and for emergency in case of failure of the engine-driven pump.

CAUTION

Operate the auxiliary fuel pump when changing tanks, to prevent loss of fuel pressure.

1-51. FUEL TANK PRESSURIZING SYSTEM CONTROL. The main and reserve fuel tanks are equipped with the Bendix Fuel Pressurizing System. The manual shut-off valve for this system is controlled by a push-pull "T" handle located on the fuel control panel.

a. Pull handle to "RELEASE PRESSURE".

b. Push handle to "RESTORE PRESSURE".

Note

The pressurizing system is effective at altitudes above approximately 12000 ft and is used for operations at higher altitudes than can otherwise be realized with the use of the auxiliary fuel pump only, and for high altitude economical cruising.

1-52. FUEL PRESSURE. The fuel pressure gage is located on the right hand instrument panel.

Desired	—17 psi
Allowable	—16-18.5 psi
Minimum Idling	— 7 psi

1-53. FUEL TRANSFER SYSTEM (F6F-5 AND -5N). The fuel transfer system replaces fuel consumed from the right main tank with that from any selected droppable tank. The fuel transfer solenoid valve is energized through a cam on the fuel tank selector when any droppable tank position is selected. This solenoid valve opens for fuel transfer only when all three of the following conditions are in effect, thus completing the electrical circuit:

a. A droppable tank is selected.

b. Fuel level in the right main tank drops below 81 gallons.

c. The auxiliary fuel pump switch is turned to "ON" position.

1-54. When the fuel level of the right main tank reaches 81 gallons, the system stops transferring automatically.

1-55. DROPPABLE TANKS RELEASE CONTROLS.

1-56. FUSELAGE DROPPABLE TANK RELEASE. A release switch with safety cap is located on the left hand side of the cockpit just above the cowl flaps control. A manual release is provided in the form of a "T" handle control located on the inboard side of the fuel control panel. To release the fuselage droppable tank, proceed as follows:

a. Turn auxiliary fuel pump switch—"ON".

b. Turn fuel tank selector valve handle to a full tank.

c. Pull the manual release "T" handle to the "UP" position then rotate clockwise.

d. Press spring-loaded release switch on left hand side of cockpit.

e. If electrical switch fails to function, pull the manual release "T" handle to "FULL UP" position.

1-57. WING DROPPABLE TANKS RELEASE. The left and right wing droppable tanks are released by the armament controls. A manual release for each tank is provided in the form of a "T" handle control located to the left of the lower control panel. To release the wing tanks, proceed as follows:

a. Turn auxiliary fuel pump switch—"ON".

b. Turn fuel tank selector valve handle to a full tank.

c. Bomb—RP selector switch—"BOMB".

d. Switch for tank or tanks (left—right shackle) to be released—"ON".

e. Armament master switch—"ON".

f. Press bomb button on stick grip.

1-58. OIL SYSTEM.

1-59. OIL SPECIFICATION. Grade 1100 or 1120, Spec. AN-O-8.

1-60. TANK AND COOLER. The oil tank, located in upper part of the engine accessory compartment, has a capacity of 19 U.S. (15.8 Imperial) gallons with a three gallon foaming space. The tank is provided with a warm-up compartment. The oil cooler, containing an automatic oil temperature control valve, is located in the bottom of the fuselage just aft of the firewall. The control valve causes the oil to by-pass the cooler when the oil-from-engine temperature is below 54°C (130°F), directing the outlet oil-from-engine back to the bottom of the oil tank for warm-up. Consequently, the tank supply of oil is by-passed when starting the engine, until the oil-from-engine temperature reaches approximately 54°C (130°F). The oil is then passed through the core of the cooler and returned to the top of the oil tank.

1-61. OIL SYSTEM CONTROLS.

1-62. OIL COOLER AND INTERCOOLER SHUTTERS. The oil cooler and intercooler shutters control the flow of cooling air to the oil cooler and the intercoolers, and are operated by a hydraulic control lever. On the F6F-3 and -3N airplanes one control lever, located on the left hand cockpit shelf, controls both the intercooler and oil cooler shutters.

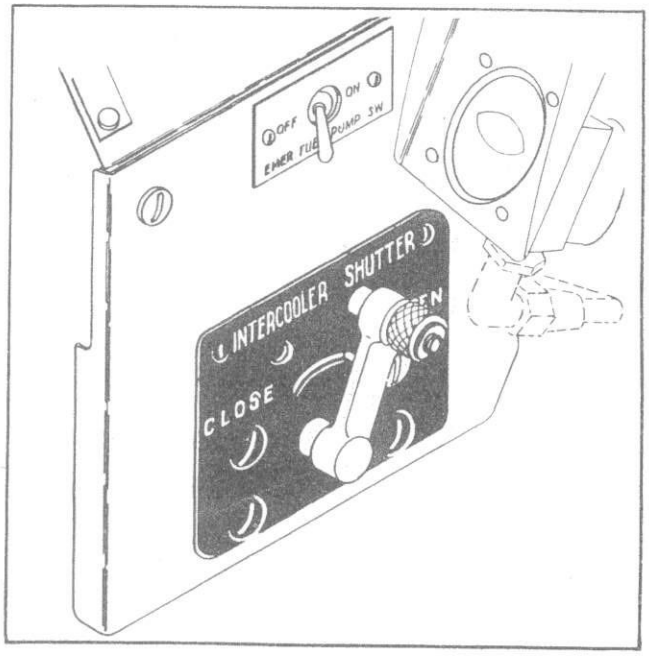


Figure 1-13. Intercooler Shutters Control

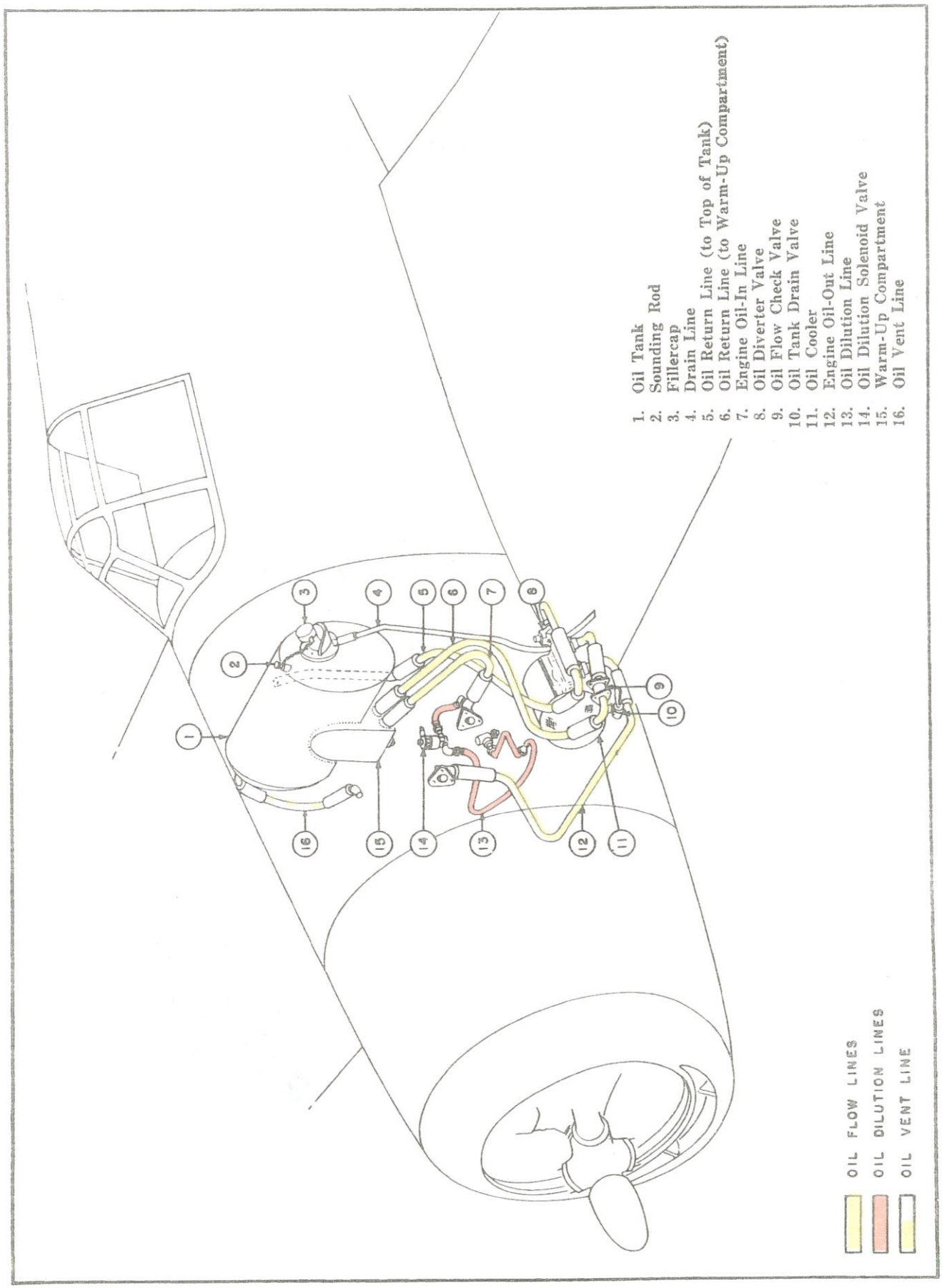


Figure 1-14. Oil System Diagram

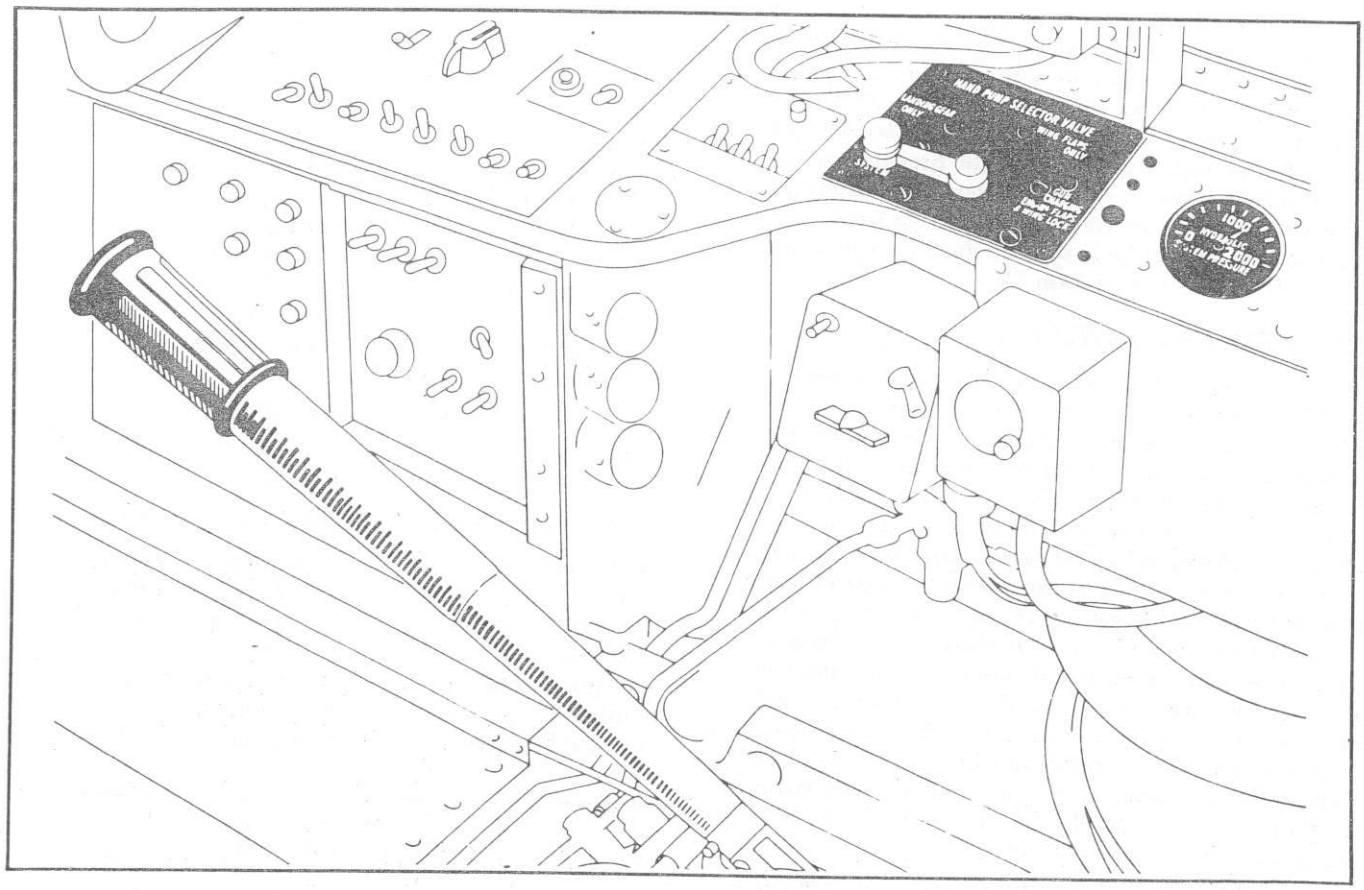


Figure 1-15. Hydraulic Hand Pump, Hand Pump Selector Valve, and Hydraulic Pressure Gage

a. Move lever FORWARD to "OPEN".

b. Move lever AFT to "CLOSE".

1-63. INTERCOOLER SHUTTERS. On the F6F-5 and -5N airplanes there are separate control levers for each unit. The intercooler shutters control lever is located on the left hand side of the cockpit forward of the fuel control panel.

a. Move lever FORWARD to "OPEN".

b. Move lever AFT to "CLOSE".

1-64. OIL DILUTION SWITCH. The oil dilution switch, that controls the oil dilution cut-off valve and diverter valve, is located on the fuel control panel. For operation of oil dilution, refer to Section II.

1-65. HYDRAULIC SYSTEM.

1-66. GENERAL. The hydraulic system, containing approximately four U.S. gallons (3.32 Imperial gallons) of fluid, Spec. AN-VV-O-366 (red color), operates the landing gear, wing flaps, cowl flaps, oil cooler and intercooler shutters, gun chargers, and wing hinge lockpins.

1-67. NORMAL OPERATION. The hydraulic system is normally operated by the engine-driven hydraulic pump located in the engine accessory compartment. The various functions of the system are controlled by hydraulic selector control valves located in the cockpit. The system pressure gage is located on the right hand cockpit shelf. The normal hydraulic system operating pressure is 1500 psi.

1-68. HAND PUMP OPERATION. A hydraulic hand pump is located on the cockpit floor to the right of the pilot's seat. This pump is used to operate the hydraulic system when the engine-driven pump is not functioning. The hand pump selector valve control, located on the right hand cockpit shelf, governs the systems to be operated by the hand pump. The selector valve handle has four positions—reading clockwise, they are: "SYSTEM", "LANDING GEAR ONLY", "WING FLAPS ONLY", "GUN CHARGING—ENGINE FLAPS AND WING LOCK".

CAUTION

When the hydraulic hand pump is not being used, the hand pump selector valve control handle should be kept in the "SYSTEM" position.

1-69. CHECKING INDIVIDUAL SYSTEMS. Under normal operation, when the hand pump selector valve control handle is moved from point to point, the system pressure gage indicates the pressure in that particular system selected. Thus, if the control handle is set on "SYSTEM", the gage will indicate malfunc-

tioning of the engine-driven pump if pressure falls below 1200 psi. In the event of hydraulic system failure, due to an opening in a line or unit, each individual system can be checked with the hydraulic hand pump. Approximately eight to ten strokes are sufficient to determine whether or not pressure can be built up in that system. When the leak is located, the pilot shall then refrain from using the damaged system in order to retain the hydraulic fluid for operation of the other units. See Section IV.

1-70. ELECTRICAL SYSTEM.

1-71. GENERAL. The airplane is provided with a 28.0 volt, single wire, grounded return electrical system. The power equipment consists of an engine-driven generator and a 24 volt, 11 ampere-hour battery which is located on the left hand side of the fuselage aft of the cockpit. The generator circuit is equipped with a voltage regulator and a reverse current relay. When the engine is running, all of the energy for the various systems is supplied by the generator which also maintains the battery in a charged condition. The battery switch, located on the outboard side of the distribution panel, has two positions—"ON" and "OFF". The battery switch must be in "OFF" position before leaving the airplane. The recognition lights and the **IFF destructor circuits** are not affected by this switch since they are energized by their own controls regardless of battery switch position.

1-72. SYSTEM UNITS. The following units are operated electrically:

Wheel & Flap Position
Starter
Fuel Transfer System
Water Injection System
Compass—Remote
Wing Flaps Control
Arresting Hook
Primer
Auxiliary Fuel Pump
Lights
Fuel Quantity Gage
Cockpit Heater (early model airplanes)
Pitot Tube Heater
Gun Selector & Master Switches
Gun Trigger Switch
Gun Camera
Gunsight
Gun Heating
Droppable Fuel Tank Releases
Fusing & Selecting of Bombs
Bomb Release
Rocket Distributor
Generator Warning Light (F6F-5N)
Oil Dilution

1-73. DISTRIBUTION PANEL AND SWITCH BOX. The electrical system of the airplane is controlled mainly by switches, rheostats and circuit breakers on the electrical distribution panel and switch box, located on the right hand cockpit shelf. Operation of the controls on this panel is directed by the instructions printed on the adjacent nameplates.

SWITCHES

Section Light (2)	Primer
Wing Running Lights	Battery
Tail Running Light	Gun Selectors
Formation Lights (2)	Gunsight
Master Exterior Lights	Gun Camera
Arresting Hook	Gun Master
Starter	Bomb Selector
Pitot Tube Heat	Bomb Fusing
Radio Master	

RHEOSTATS—LIGHTS

Chartboard	Cockpit
Instrument Panel	Gunsight

CIRCUIT BREAKERS (MANUALLY RESET)

Radio IFF	Gun Camera Solenoid
Gunsight	Gun Camera Heater
Exterior Lights	Recognition Lights
Instruments	Gun Heaters (2)
Cockpit Lights	Panel Receptacle
Bomb Fusing	Compass—Remote
Droppable Tank	Arresting Hook

KEY TO FIGURE 1-16
HYDRAULIC SYSTEM

1. Wing Flap Cylinder
2. Restrictor
3. Gun Charging Cylinder
4. Wing Lock Cylinder
5. Wing Folding Timer Check Valve
6. Landing Gear Cylinder
7. Shuttle Valve
8. Reservoir
9. Accumulator
10. Filter (Engine-Pump Line)
11. Unloader Valve
12. Engine-Driven Pump
13. Intercooler Flap Cylinder
14. Cowl Flap Cylinder
15. Restrictor
16. Gun Charging Valve
17. Landing Gear Dump Valve
18. Landing Gear Vent Valve
19. Landing Gear Selector Valve
20. Cowl Flap Selector Valve
21. Oil Cooler Selector Valve
22. Wing Flap Selector Valve
23. Air Bottle
24. Check Relief Manifold
25. Wing Lock Selector Valve
26. Air Pressure Gage
27. Air Bottle Filling Valve
28. System Pressure Gage
29. Hand Pump Selector Valve
30. Hand Pump
31. Oil Cooler Flap Cylinder
32. Tail Wheel Cylinder
33. Relief Valve
34. Intercooler Selector Valve
35. Filter (Hand Pump Line)
36. Pressure Snubber

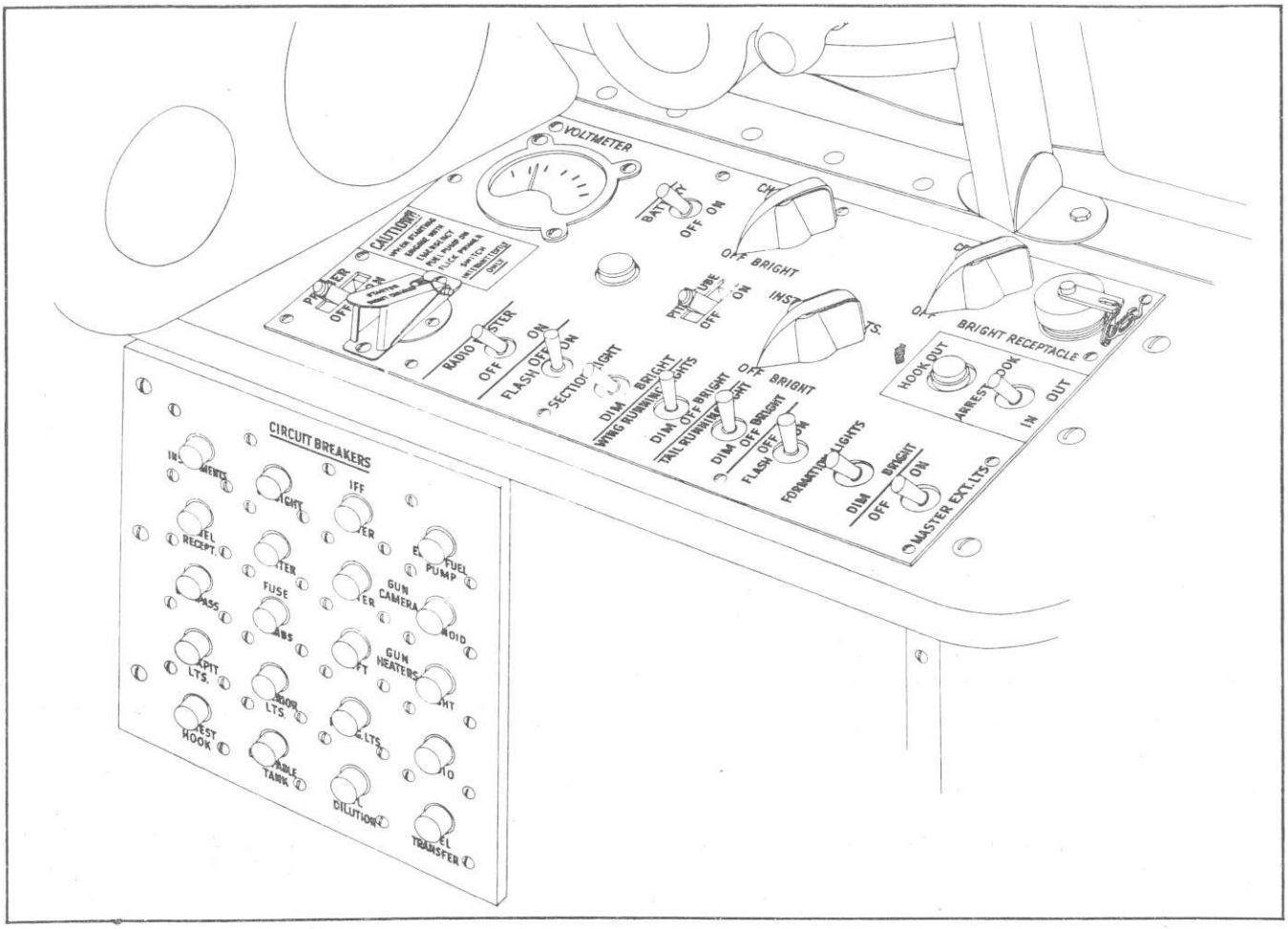


Figure 1-17. Electrical Distribution and Circuit Breaker Panels

1-74. VOLTMETER. A voltmeter is installed on the outboard side of the electrical distribution panel. This meter indicates battery volts when the engine is not running over the generator cut-in speed. System volts are indicated when the generator is operating at engine speeds above 1300 rpm.

Note

Early model airplanes are equipped with a volt-ammeter. It normally indicates generator amperes. Battery and system volts may be read by pushing the button on the face of the meter.

1-75. COCKPIT LIGHTS. The cockpit lights are controlled by the cockpit lights rheostat located on the electrical distribution panel. The intensity of the chartboard light and the instrument panel light is regulated by the rheostat for each one marked on the adjacent nameplates. Turning any of these rheostats to the "OFF" position will shut off the lights they control.

1-76. EXTERIOR LIGHTS. The exterior lights are controlled by switches on the electrical distribution panel. They include:

Landing
Section
Wing Running
Tail Running
Formation

Note

Landing lights are installed in early model airplanes and night fighters only.

1-77. FLUORESCENT LIGHTS (F6F-3 AND -3N ONLY.) Fluorescent lights are controlled by rheostats located on the lower center instrument panel. To start the lights: Turn rheostat to "START", hold for a few seconds until light is ON, then turn to "DIM" or "BRIGHT" as required. In order to obtain ordinary or bright lights, turn the head of the light 90°, to whichever is desired. If the lights fail to operate, push the fluorescent lights circuit breaker reset button.

1-78. APPROACH LIGHT SWITCH. This switch is provided in the mid-fuselage junction box thereby making it possible to open the approach light circuit when simulating carrier operations on land. Prior to carrier operations the switch, located in the mid-fuselage junction box, should be checked to insure that it is in the "ON" position.

1-79. SPARE LIGHT BULBS. A spare bulbs container is provided in the fuselage at Station #127. A spare bulb for the gun sight is held in place by a clip mounted on gun sight mount bracket. On the F6F-5 and -5N airplanes, spare instrument panel bulbs are located on the left hand side of the instrument panel.

1-80. RECOGNITION LIGHTS SWITCHES. The recognition lights and keying switches are located on the right hand shelf just aft of the distribution panel. A switch is provided to select each light as desired. Throwing any switch to "STEADY" position will not cause the light to glow until the recognition lights keying switch is operated. If any light fails to operate, push the circuit breaker reset button, for this circuit.

1-81. PITOT TUBE HEATER. The pitot tube heater switch is located on the distribution panel. This switch should be turned to "ON" when icing conditions are encountered. If apparently incorrect airspeed is indicated during icing conditions, check the position of the switch to be sure it is in the "ON" position.

1-82. AUXILIARY CONTROLS.

1-83. LANDING GEAR CONTROL. The main and tail wheels are retracted and extended by double-acting hydraulic cylinders. The operating pressure is normally supplied by the engine-driven hydraulic pump or by the hand pump. The cylinders are controlled by the two position control lever located at the base of the left hand instrument panel. This square knob control lever is distinct in appearance, so designed to prevent inadvertant operation of the landing gear control. (For auxiliary and emergency operation of landing gear, refer to Section IV.)

a. Move lever UP for wheels "UP".

b. Move lever DOWN for wheels "DOWN".

CAUTION

Make certain that landing gear control lever is in "DOWN" position before take-off or landing.

1-84. LANDING GEAR LOCK.

1-85. The mechanical interconnector, between the landing gear square knob control lever and the nut-cracker arm on the left hand shock strut, prevents landing gear retraction on the ground. The control lever cannot be moved to the "UP" position unless the left oleo is fully extended which occurs in flight only. (Operation is completely automatic.)

1-86. On the ground, a mechanical lock prevents the drag strut knuckle from breaking under any loading condition. In flight, as the wheels retract, this lock is released during the initial motion of the hydraulic cylinders. The position of this lock is indicated electrically by a micro-switch operated by the lock itself and connected to the position indicator in the cockpit.

1-87. LANDING GEAR POSITION INDICATOR. The position of the main and tail wheels is shown on the combination flap and landing gear indicator, located on the left hand instrument panel. This indicator, in addition to showing the position of each wheel, also shows whether or not they are locked up or down.

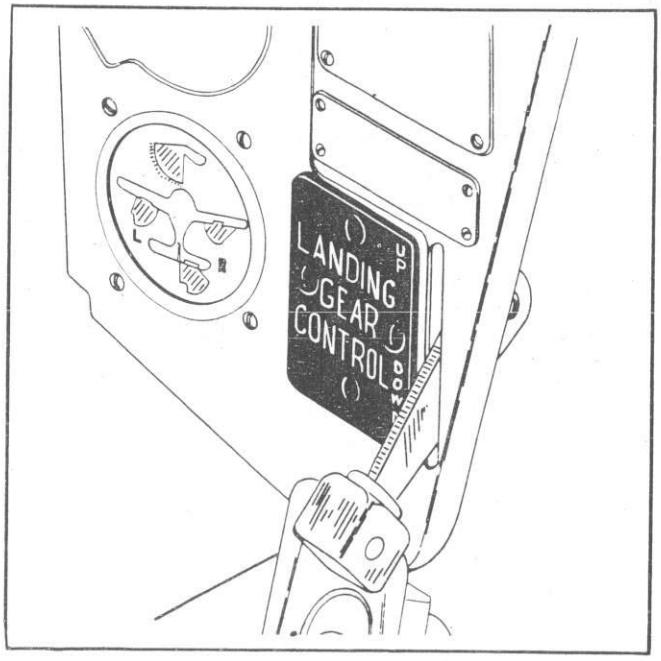


Figure 1-18. Landing Gear Control and Position Indicator

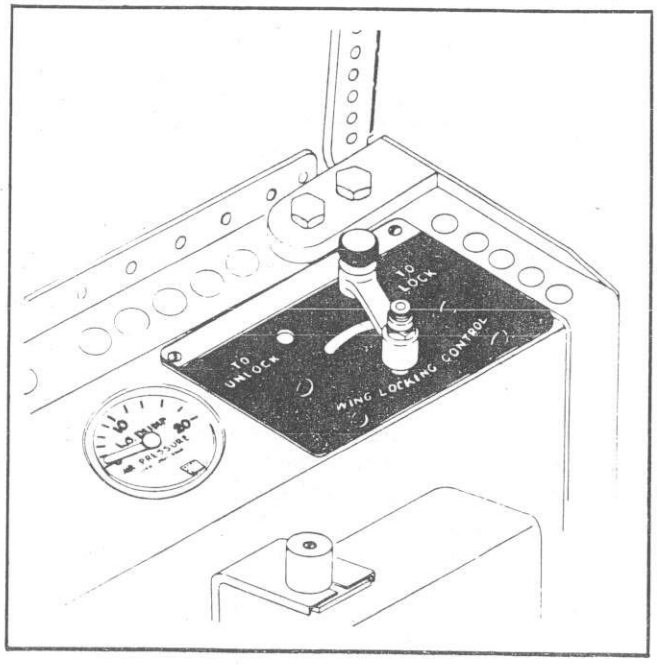


Figure 1-19. Wing Lock Control

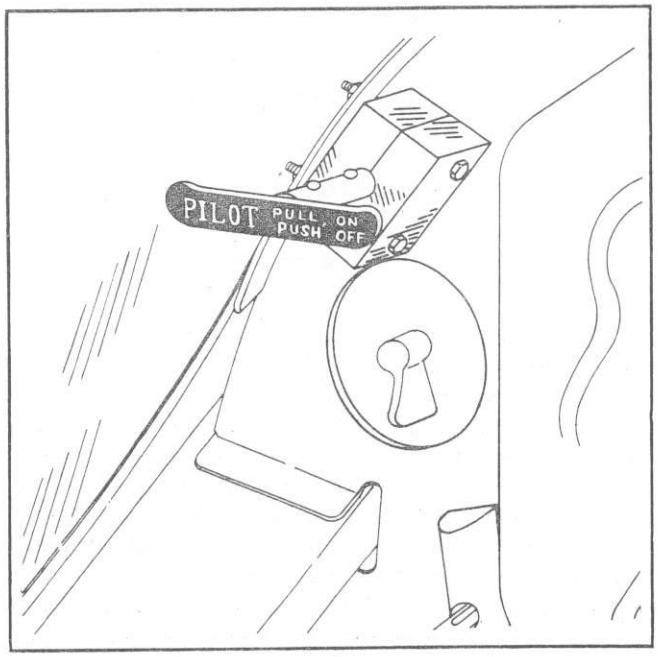


Figure 1-20. Automatic Pilot ON-OFF Control

1-88. ARRESTING HOOK CONTROL.

1-89. The arresting hook is extended and retracted electrically. The control switch and circuit breaker are located on the electrical distribution panel on the right hand side of the cockpit.

1-90. When the hook is FULL OUT, the small light adjacent to the switch will glow. The running OUT of the hook will also turn on the approach light in the left wing leading edge. (For emergency operation of the arresting hook, refer to Section IV.)

a. Move control switch OUTBOARD to "HOOK OUT".

b. Move control switch INBOARD to "HOOK IN".

CAUTION

The pilot shall insure that the switch is in the "HOOK OUT" position prior to landing aboard a carrier.

1-91. WING FOLDING.

1-92. GENERAL. The wings are spread and folded manually from the ground and are automatically locked in the FOLDED position. The wings are locked in the SPREAD position, and unlocked before folding, by hydraulically operated locking pins controlled from the cockpit. The two position hydraulic control lever, operating the locking pins, is located on the right hand cockpit shelf. Wing safety lockpins, operated by a "T" handle control located on the lower center control panel, are used to safety the main locking pins after the outer panels are moved to the SPREAD position and the main locking pins are FULLY HOME. These safety lockpins, when engaged, prevent the main locking pins from disengaging, regardless of hydraulic pressure.

1-93. As the safety lockpins are withdrawn during the folding operation, red warning cylinders appear through the upper surface on each side of the wing center section. Before take-off, check the cylinders which will be flush with the wing surface if the wings are spread and locked properly.

1-94. TO FOLD WINGS.

a. Place wing flaps in "UP" position.

b. Disengage safety lockpins by pushing "T" handle control LEFT and FULL UP to "UNLOCK".

c. Move wing fold hydraulic control lever FORWARD to "UNLOCK" position. (If engine is not running, operate hydraulic hand pump, with hand pump selector valve on "SYSTEM" or "WING LOCK".

d. Push wing outer panel aft until folded lock engages automatically.

WARNING

The clearance between part of the wing and cockpit enclosure during folding is small; therefore, do not fold wings with anyone standing on walkway, or with arms or any part of the body projecting outside of the cockpit.

1-95. TO SPREAD WINGS

a. Place wing flaps in "UP" position.

b. Move wing fold hydraulic control lever AFT to "LOCK" position.

c. Release jury lockpin control handle located in the wheel well.

CAUTION

Lift wing tips when releasing jury lockpin before spreading outer panels.

d. If engine is not running, place hand pump selector valve on "SYSTEM" and pump until system gage reads approximately 1500 psi, before pushing wings UP to SPREAD position. This operation will charge the hydraulic accumulator which has sufficient capacity to engage the main locking pins the instant the wing reaches the SPREAD position. After main pins are engaged, pump a few extra strokes to make certain that the pins are FULLY HOME.

e. Engage safety lockpins by pushing "T" handle control FULL DOWN and RIGHT to "LOCK".

f. Check red warning flags on upper surface of wing center section to make certain that they are flush with upper surface of wing.

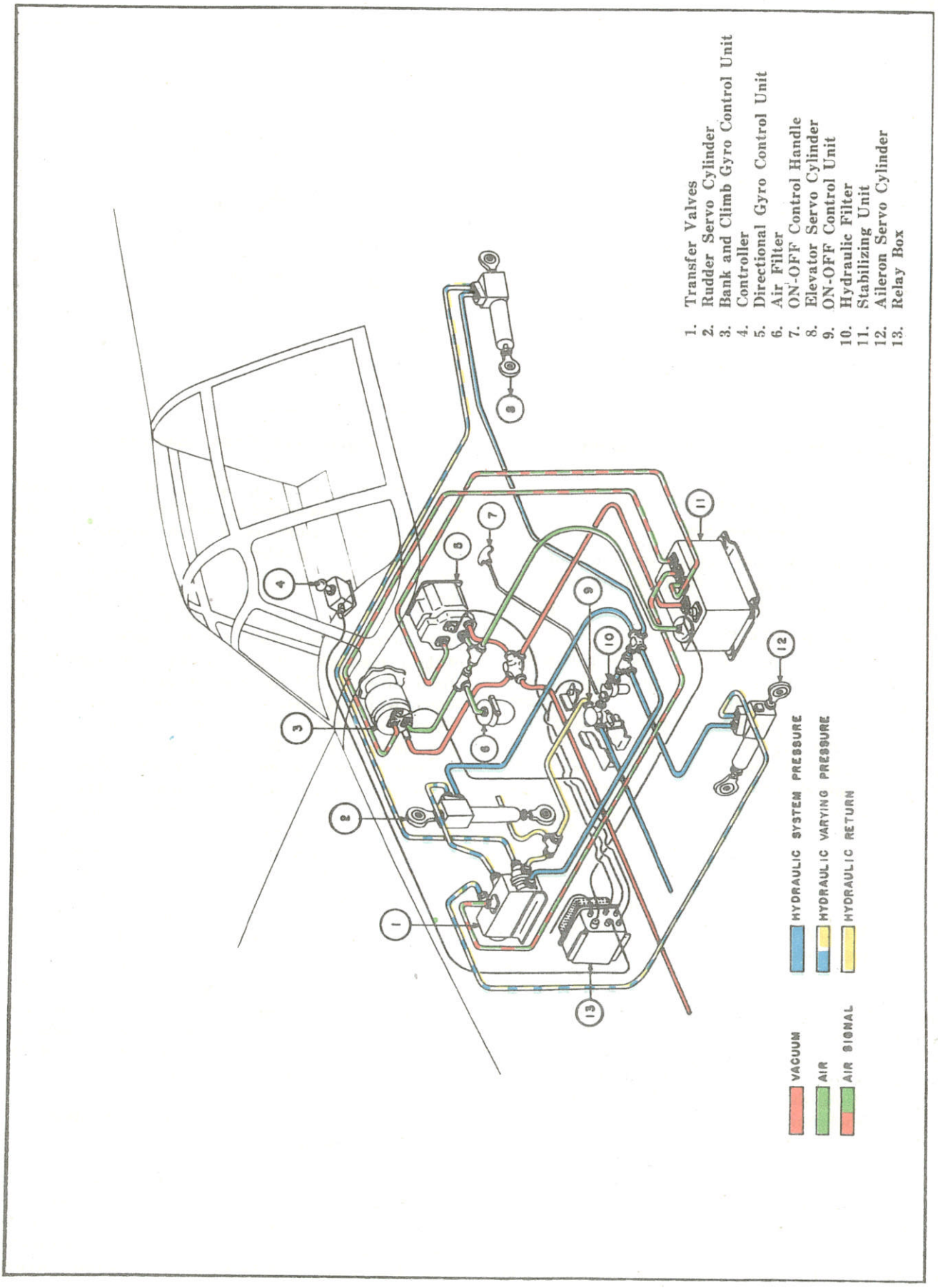


Figure 1-21. Automatic Pilot Installation Diagram (Late Model F6F-5N Airplanes)

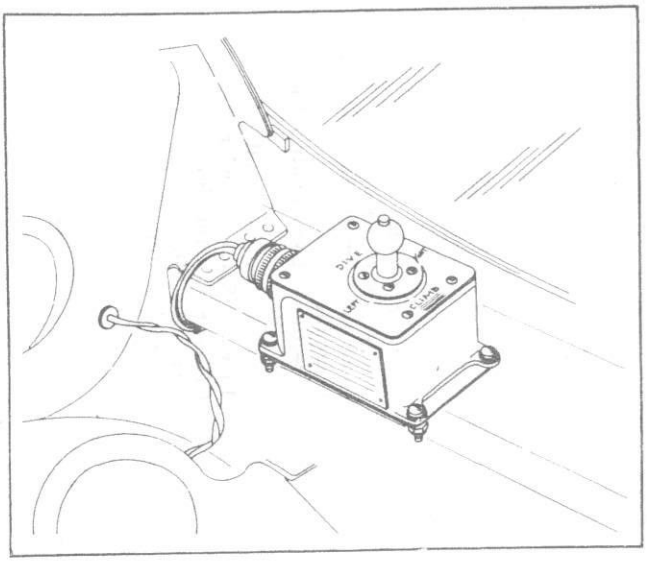


Figure 1-22. Automatic Pilot Controller

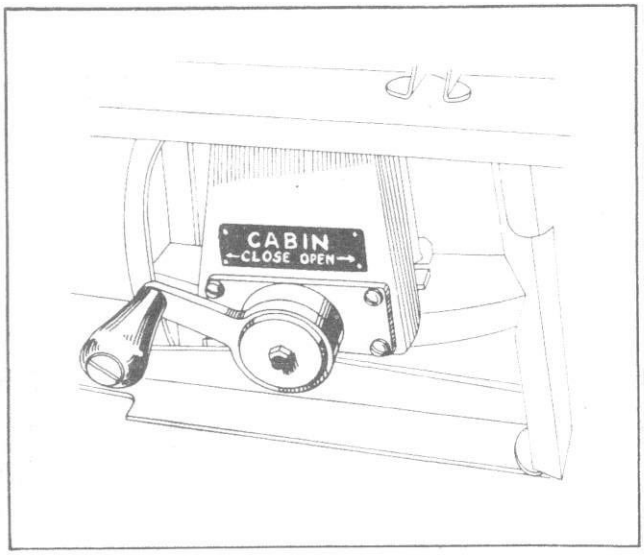


Figure 1-23. Cabin Handcrank

CAUTION

Do not allow the wing outer panels to fall free when spreading as wing folding axis may be damaged.

1-96. AUTOMATIC PILOT.

1-97. GENERAL. Late model F6F-5N airplanes are equipped with the Type GR-1 automatic pilot. The pilot is self-synchronous; that is, it may be engaged in any reasonable flight attitude and will take over and maintain the airplane in the prevailing attitude until it is changed by means of the automatic pilot controller. This eliminates the necessity of adjusting knobs, or setting dials or pointers before or after engagement. The flight attitude limits of the pilot are as follows:

Dive—50°, Climb—30°, Bank—45°

1-98. AUTOMATIC PILOT CONTROLS.

1-99. ON-OFF CONTROL HANDLE. The automatic pilot is engaged and disengaged by the ON-OFF control handle installed under the left hand side of the main instrument panel. This handle has three positions: "ON", "OFF", and "CENTRALIZED". With the airplane battery switch turned to the "ON" position and the ON-OFF handle FULL-IN or "OFF" position, the automatic pilot synchronizing system is operative. With the handle in the MIDDLE or "ON" position, synchronization ceases for the bank and climb gyro units and the automatic pilot takes control and maintains the prevailing flight attitude. When the ON-OFF handle is pulled out and held FULL-OUT in the "CENTRALIZED" position, the airplane returns to straight and level flight.

1-100. CONTROLLER. The automatic pilot controller, consisting of a small case with a controller lever projecting through the top, is mounted on the forward end of the right hand cockpit rail. The controller lever duplicates the features of the conventional airplane control stick and rudder pedals. Movement of this lever in a manner similar to the operation of the control stick, operates electrical switches which produce within the limits (noted above) of the automatic pilot the same results obtained by similar movement of the airplane control stick; i.e., left bank, right bank, climb, dive etc. The button on the lever, controls a switch which is used to engage the course holding function of the automatic pilot; i.e., to maintain the airplane on a particular course (direction). Depressing this button disconnects the synchronizing mechanism of the directional gyro control. The button may be depressed when it is desired to bank the airplane and still maintain direction without turning. A co-ordinated turn is effected by placing the control lever in either the left or right bank position without depressing the button. In all instances of operation, the lever must be held in its proper position until the desired degree of the maneuver is reached. See Section II for flight operation.

1-101. DE-ICING EQUIPMENT. F6F-3N and F6F-5N airplanes are equipped with a windshield de-icing system consisting of a one-gallon reservoir mounted forward of the firewall and a spray control knob located to the left of the main instrument panel.

1-102. MISCELLANEOUS CONTROLS AND EQUIPMENT.

1-103. COCKPIT ENCLOSURE. The cockpit enclosure consists of three pieces of Plexiglas attached to an aluminum alloy frame which rides by means of four rollers on the sections of track surrounding the cockpit. The self-locking handcrank mechanism, located

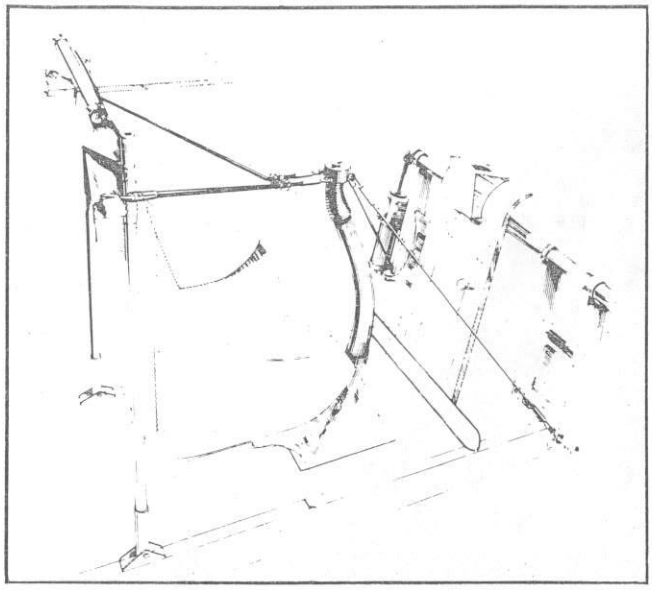


Figure 1-24. Surface Controls Lock

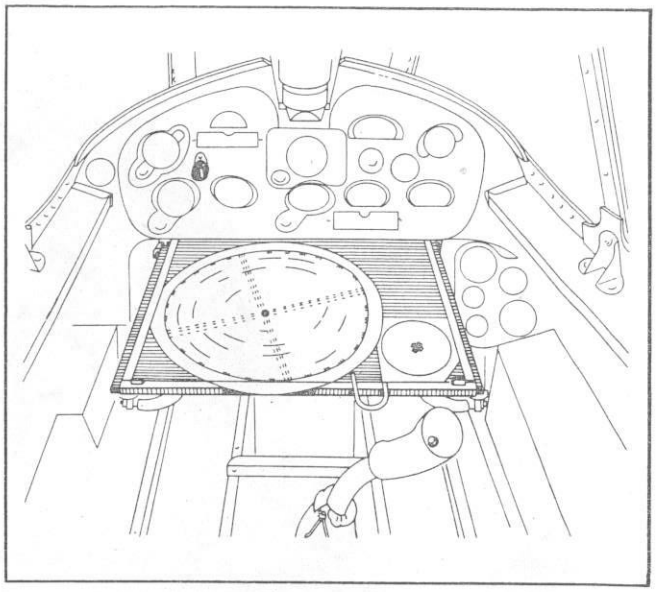


Figure 1-25. Chartboard

above the right hand cockpit shelf, propels the hood fore and aft by means of a chain and flexible cable assembly. A hold-back block installed on the right hand cockpit rail, can be swung across the track to prevent the hood from slamming closed when the airplane is brought to a sudden stop. The hood may be opened or closed from outside the airplane by pushing the button, located on the right hand cockpit exterior, and manually sliding the hood to the desired position. When the button is released the hood is automatically locked. (For emergency jettisoning of cockpit enclosure, refer to Section IV.) For normal operation, proceed as follows:

a. Rotate handwheel CLOCKWISE to "OPEN".

b. Rotate handwheel COUNTERCLOCKWISE to "CLOSE".

1-104. COCKPIT VENTILATOR. A fresh air valve, located at the base of the lower center control panel, regulates the flow of air taken from the wing leading edge ducts to the cockpit. The pilot can open or close the valve by pushing his foot against the knob located on the right hand side of the valve.

a. Apply foot to UPPER side of knob to "CLOSE".

b. Apply foot to LOWER side of knob to "OPEN".

1-105. COCKPIT HEATER. The cockpit heating and ventilating system consists of a hot air combustion type heater. An electric blower unit forces hot air up through the windshield duct and back to the rear of the cockpit. A switch, which controls the blower and gas ignitor simultaneously, is located on the electrical distribution panel. (On the F6F-3 airplane, the switch is located on the lower center control panel.) A heat control lever, located on the lower center control panel, directs the flow of warm air.

a. Move lever FULL-UP for windshield "DEFROSTER".

b. Move lever to CENTER for "DEFROSTER AND FEET".

c. Move lever FULL-DOWN for "FEET ONLY".

Note

The cockpit heating and windshield defroster system was eliminated on later model airplanes.

1-106. SURFACE CONTROLS LOCK. The control stick and rudder pedals are secured by the lashing device provided with each airplane. The device consists of a metal cap which slides over the top of the pistol grip and four cables, two of which connect to the base of the rudder pedals and two connect aft to the hooks provided at the rear of the cockpit rail.

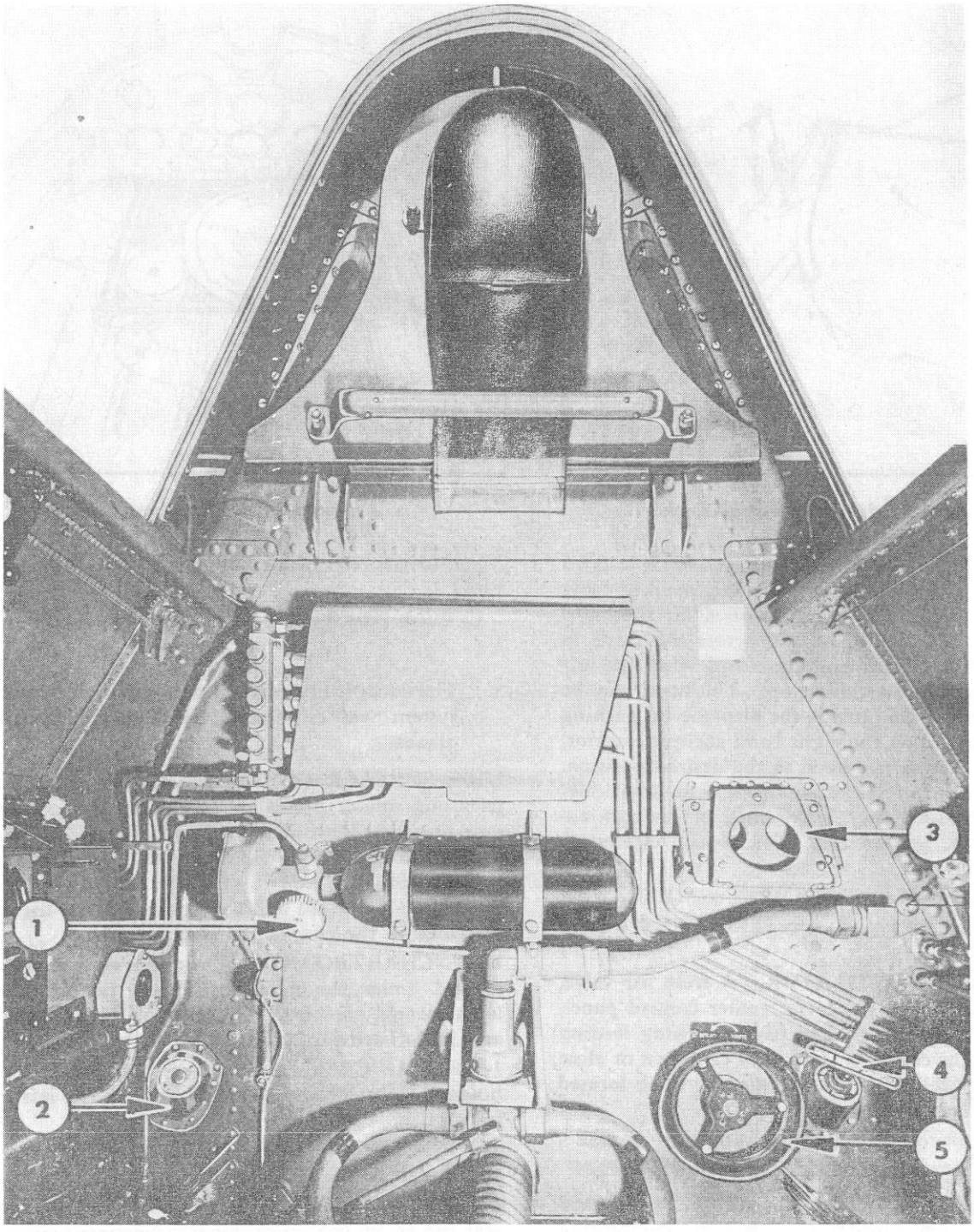
1-107. CHARTBOARD. The pilot's chartboard is stowed under the main instrument panel. Depress latch located on lower left corner of instrument panel and pull chartboard AFT.

1-108. MAP CASE. A map case with pad and pencil holder is located on the cockpit floor to the left of the pilot's seat.

1-109. RELIEF TUBE. A relief tube is stowed in a clip under the pilot's seat.

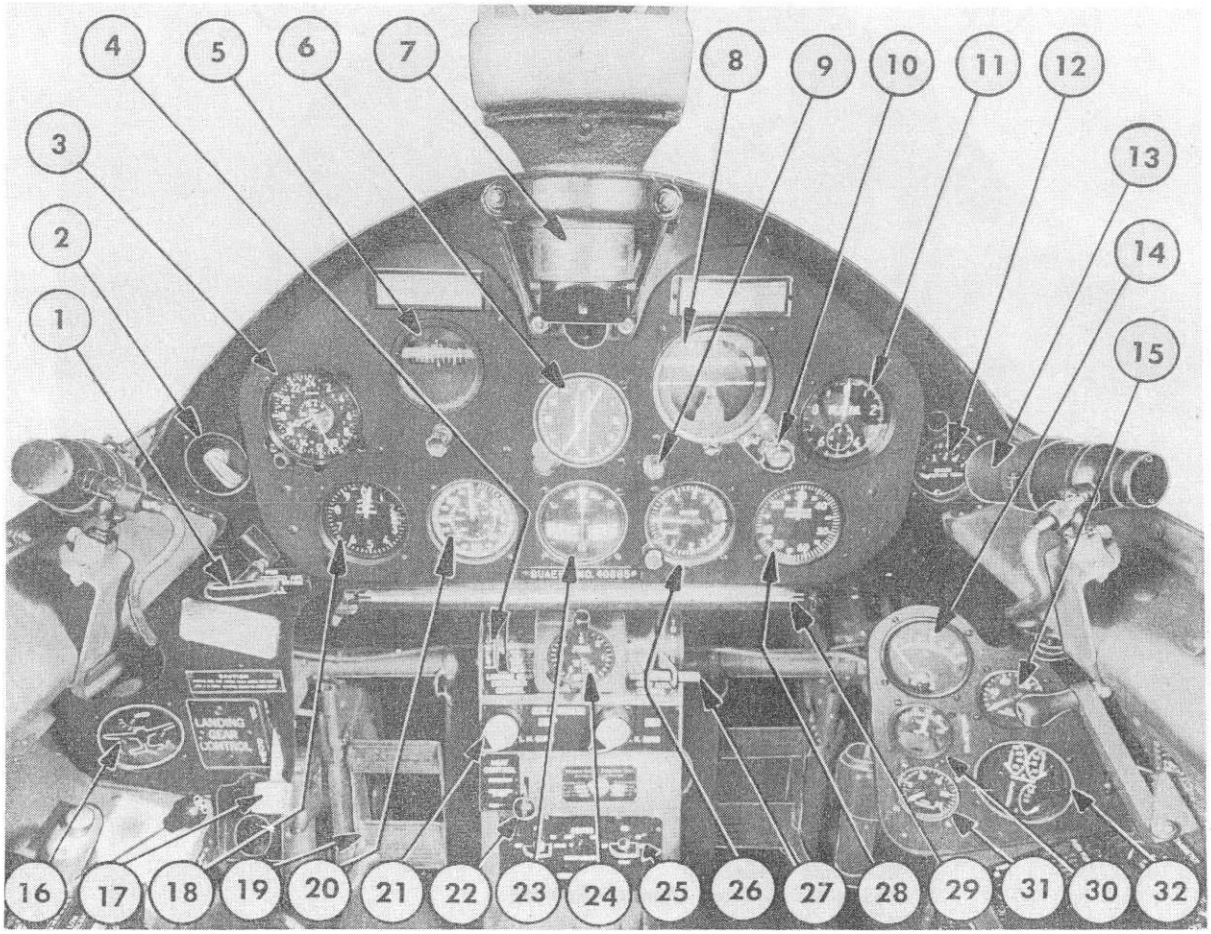
1-110. PILOT'S SEAT AND HARNESS. The pilot's seat can be moved up or down (adjustment six in.) by the control lever located on right hand side of the seat. Pull lever UP to change adjustment either way. A shoulder harness adjustment lever is located on the left hand side of the pilot's seat. Push lever AFT to change adjustment.

1-111. ANTI-BLACKOUT EQUIPMENT. Provisions are made for the attachment of anti-blackout equipment. A quick-disconnect assembly, for attachment of the anti-blackout suit, is installed on the cockpit floor on the left hand side of the pilot's seat.



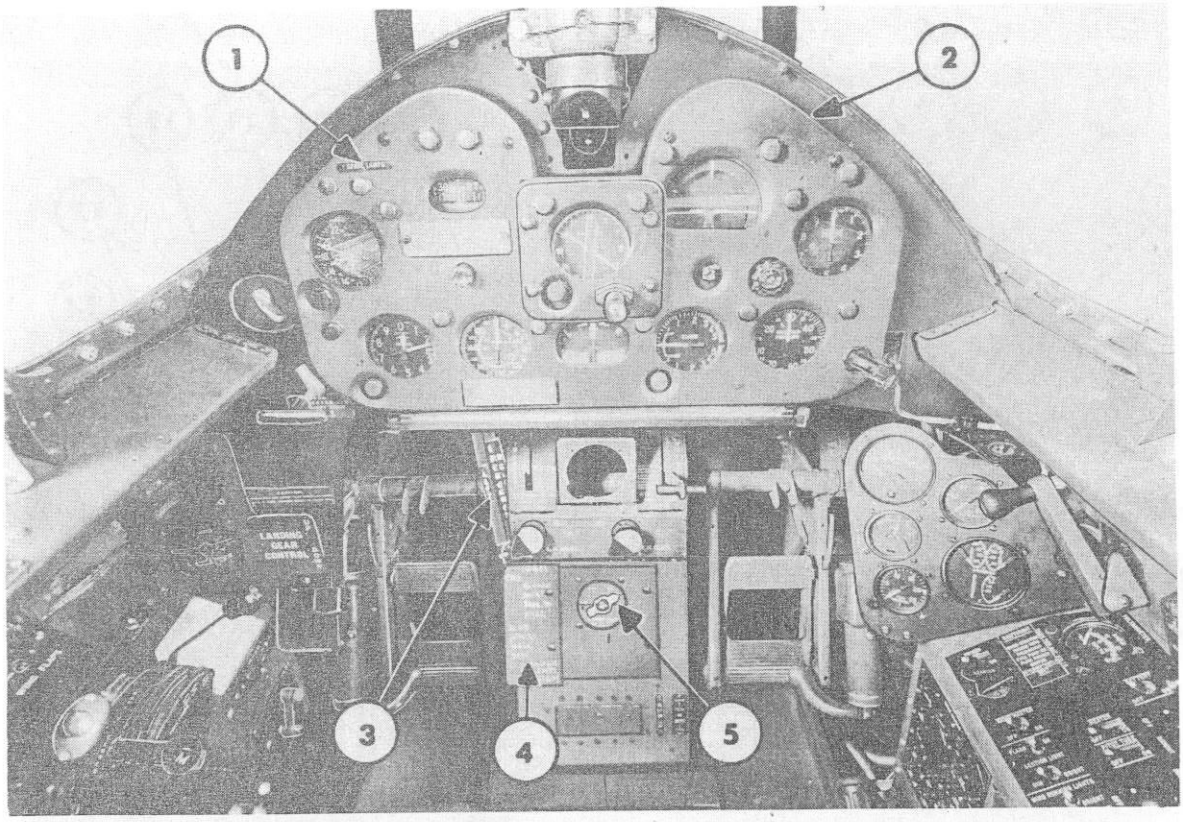
1. Landing Gear Emergency Dump Test Valve
2. Tow Target Release Control
3. Oxygen Regulator Support
4. Arresting Hook Emergency Control
5. Oxygen Cylinder Control Handle

Figure 1-26. Cockpit—Rear View



1. Carburetor Protected Air Control (Aux. Stage Only)
2. Ignition Switch
3. Clock
4. Landing Gear Emergency Lowering Control
5. Directional Gyro
6. Compass
7. Gunsight
8. Attitude Gyro
9. Chartboard Light
10. Attitude Gyro Caging Knob
11. Tachometer
12. Water Quantity Gage—A.D.I. System
13. Instrument Panel Fluorescent Light
14. Cylinder Head Temperature Gage
15. Oil Pressure Gage
16. Landing Gear & Wing Flap Position Indicator
17. Landing Gear Control
18. Altimeter
19. Rudder Pedals
20. Airspeed Indicator
21. Gun Charging Controls
22. Cockpit Heater Control
23. Turn and Bank Indicator
24. Ammunition Rounds Counter
25. Fluorescent Lights Control
26. Rate of Climb Indicator
27. Wing Lock Safety Control Handle
28. Manifold Pressure Gage
29. Chartboard
30. Oil-In Temperaure Gage
31. Fuel Pressure Gage
32. Fuel Quantity Gages

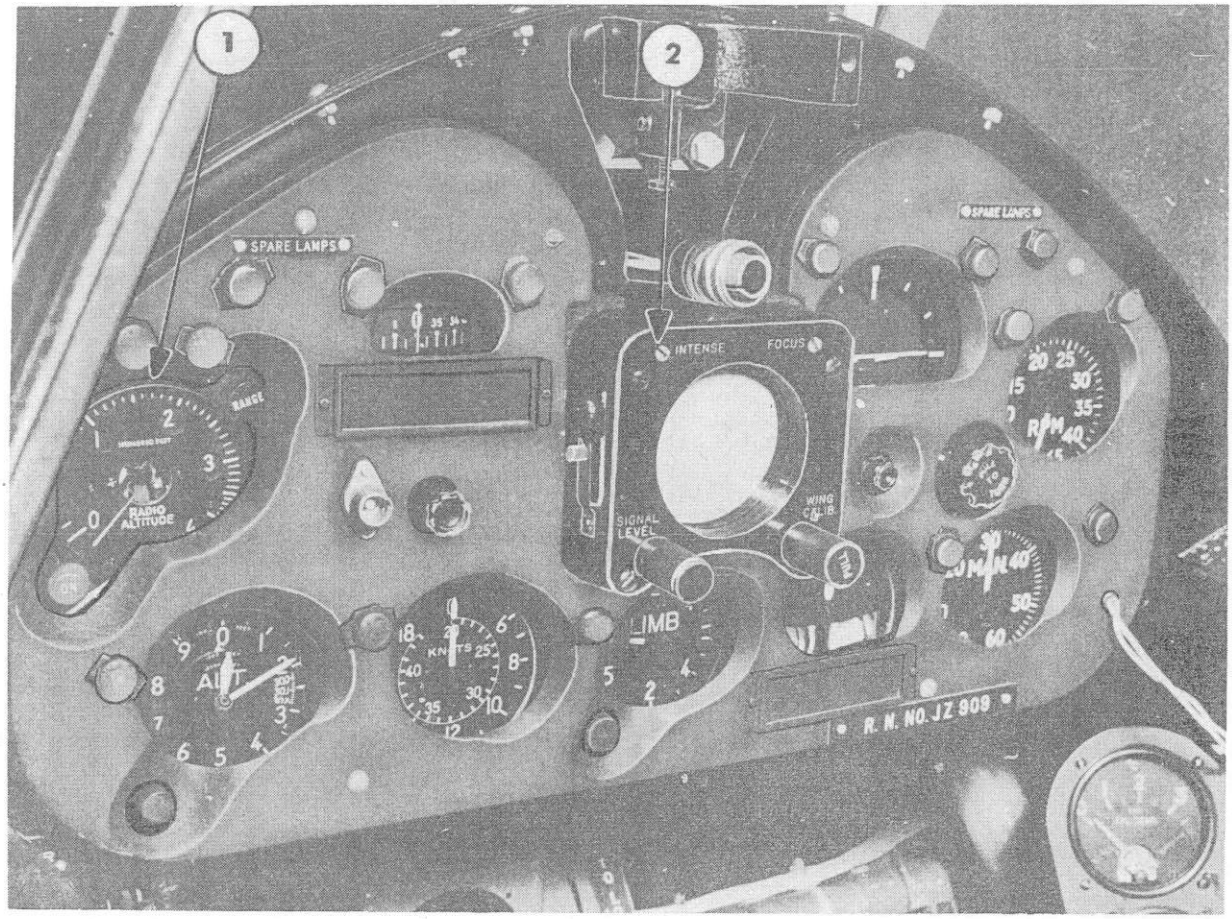
Figure 1-27. Cockpit—Forward View (F6F-3)



The F6F-5 differs from the F6F-3 in the following respects:

1. Spare Lamps Container
2. Reflector Panel
3. Wing Bomb Rack Manual Release
4. Check-Off Card
5. MK I Rocket Selector
6. Removal of Fluorescent Lights and Control
7. Removal of Cockpit Heat Control Switch to Main Electrical Distribution Panel

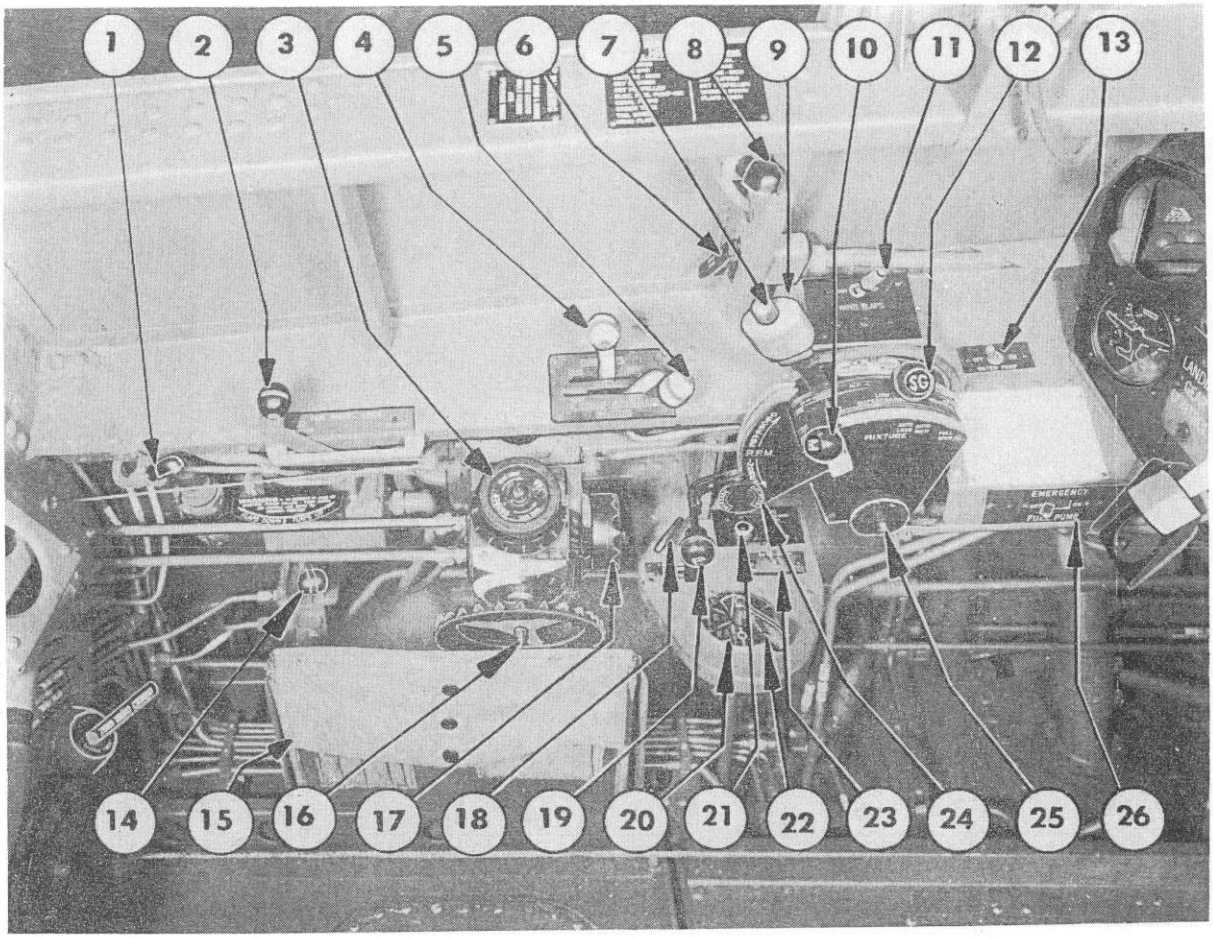
Figure 1-28. Cockpit—Forward View (F6F-5)



The F6F-5N differs from F6F-5 in the following respects:

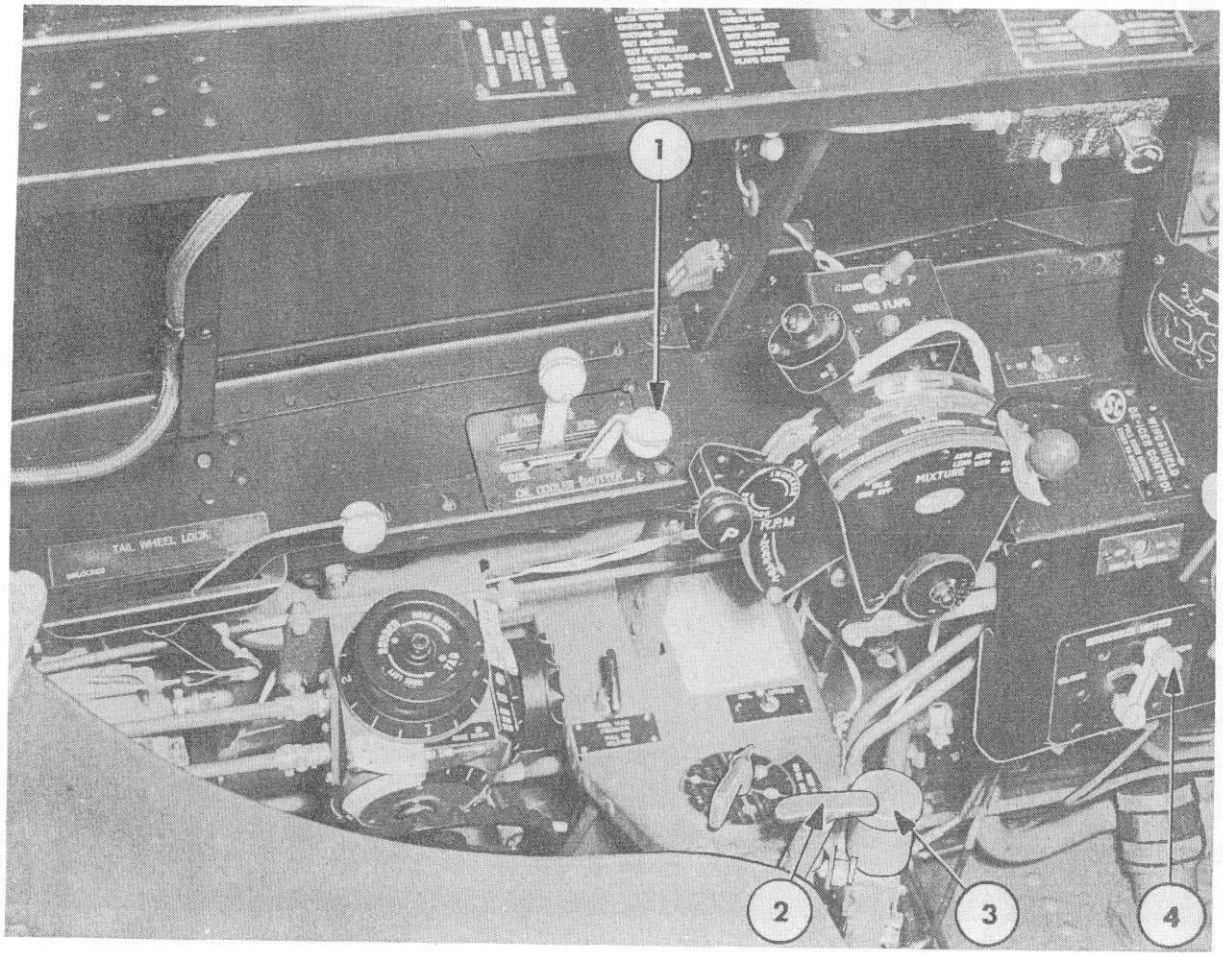
1. Radio Altimeter Indicator
2. Radar Scope

Figure 1-29. Cockpit—Forward View (F6F-5N)



1. Lower Left Cockpit Light
2. Tail Wheel Lock Control
3. Rudder Trim Tab Control
4. Cowl Flaps Control
5. Oil Cooler-Intercooler Shutters Control
6. Droppable Fuel Tank Release Switch
7. Mask Microphone Switch
8. Upper Left Cockpit Light
9. Throttle Control
10. Mixture Control
11. Wing Flap Electrical Switch
12. Supercharger Control
13. Water Injection Control Switch
14. Wing Flap Manual Control
15. Map Case
16. Elevator Trim Tab Control
17. Aileron Trim Tab Control
18. Fuel Tank Pressurizing Control
19. Propeller Pitch Control
20. Fuel Selector Valve Dialface
21. Reserve Fuel Tank Pressurizing Control
22. Fuel Tank Selector Valve Control
23. Oil Dilution Switch
24. Propeller Pitch Vernier Control
25. Engine Control Quadrant Friction Knob
26. Auxiliary Electric Fuel Pump Switch

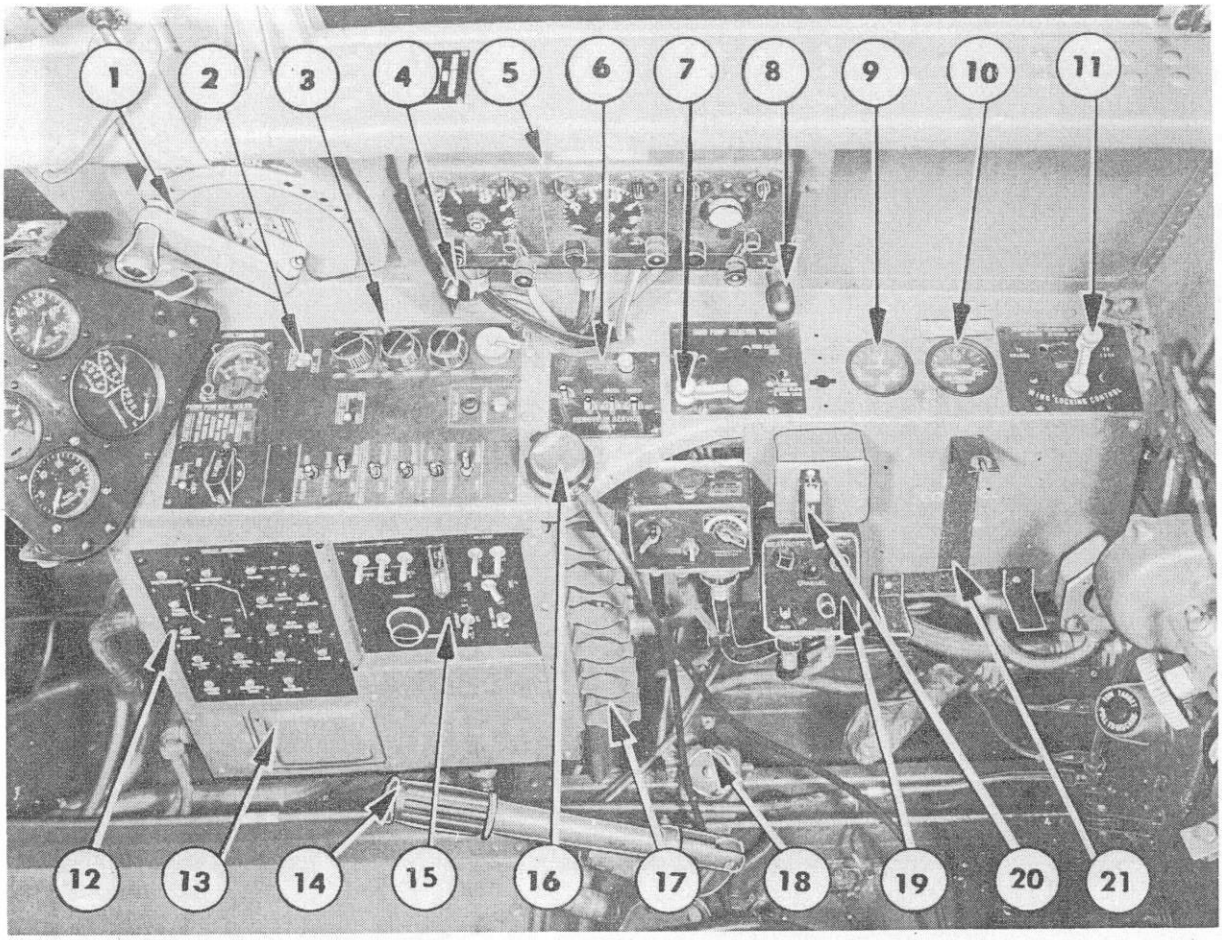
Figure 1-30. Cockpit—Left View (F6F-3)



The F6F-5 differs from the F6F-3 in the following respects:

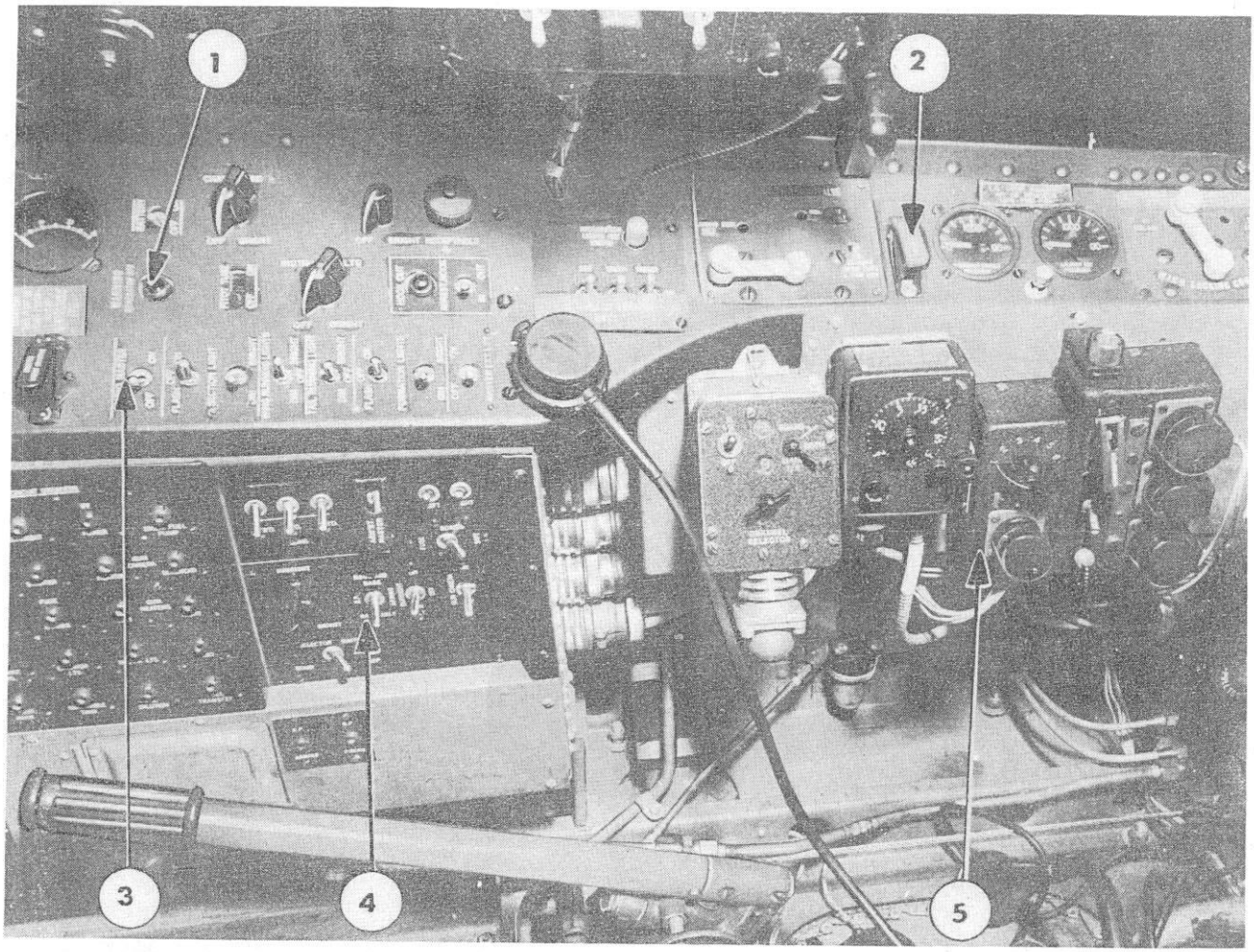
1. Oil Cooler Shutter Control
2. Fuselage Droppable Tank Manual Release Control
3. Anti-Blackout Regulator
4. Intercooler Shutter Control
5. Removal of the Fuel Level Warning Light

Figure 1-31. Cockpit—Left View (F6F-5)



1. Cabin Sliding Hood Control
2. Battery Switch
3. Main Electrical Distribution Panel
4. Electrical Panel Light
5. Radio Controls
6. Recognition Lights
7. Hand Pump Selector Valve
8. Aft Right Cockpit Shelf Light
9. Hydraulic System Pressure Gage
10. Landing Gear Emergency Dump Pressure Gage
11. Wing Locking Hydraulic Control
12. Manual Reset Circuit Breaker Panel
13. Access to Reverse Current Relay
14. Hydraulic Hand Pump
15. Armament Panel
16. Hand Microphone
17. Pyrotechnic Cartridge Clips
18. Pyrotechnic Pistol Retainer
19. Radio Controls
20. IFF Destruction Switch
21. IFF Equipment Support

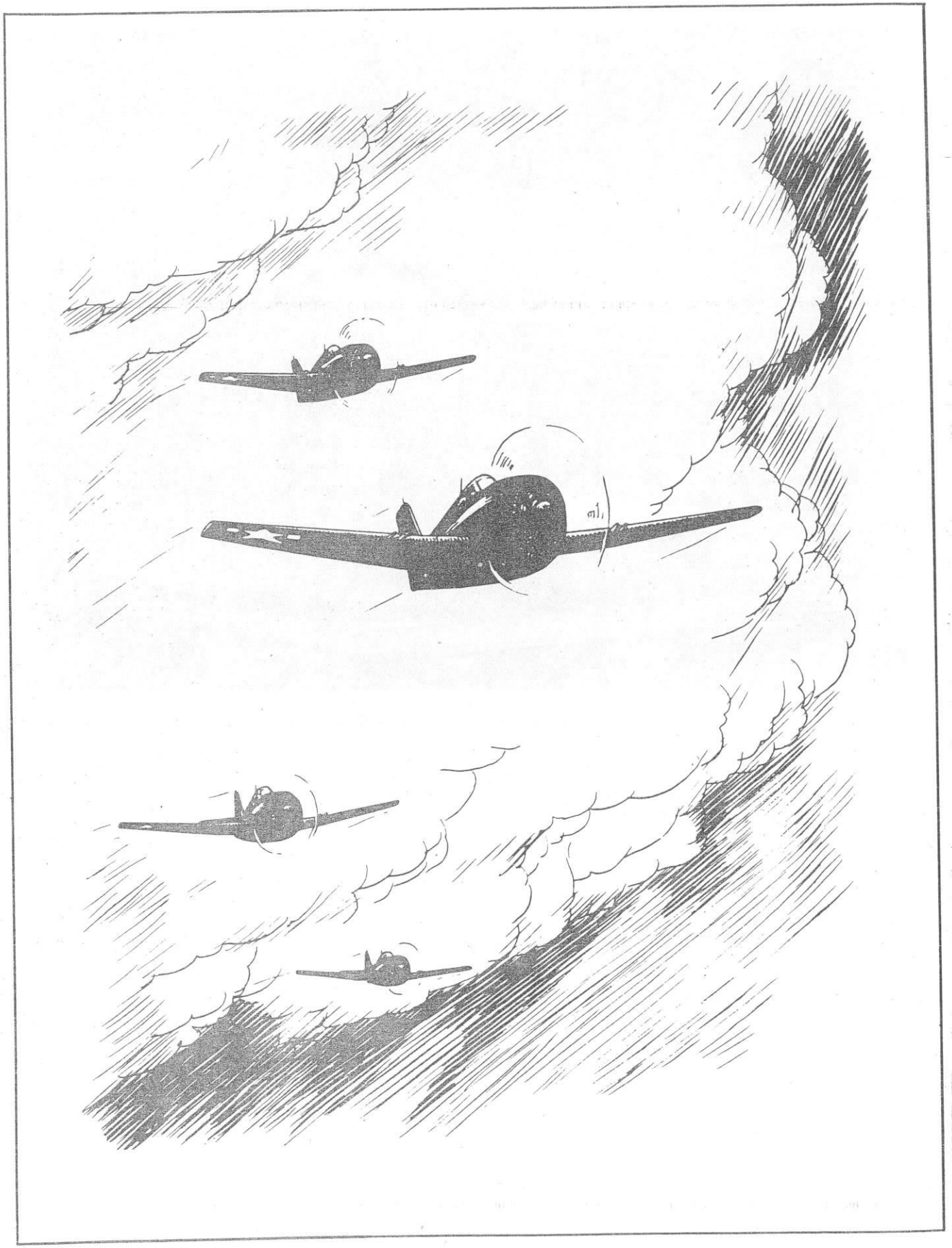
Figure 1-32. Cockpit—Right View (F6F-3)

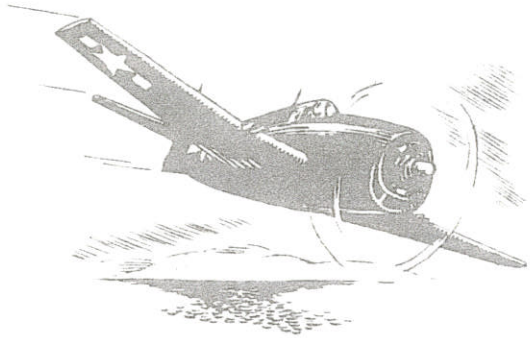


The F6F-5 differs from the F6F-3 in the following respects:

1. Generator Warning Light
2. IFF Destructor Switch
3. Radio Master Control Switch
4. Rocket Projectile Arming Switch
5. IFF Controls

Figure 1-33. Cockpit—Right View (F6F-5)





SECTION II
NORMAL OPERATING INSTRUCTIONS

2—1. BEFORE ENTERING THE COCKPIT.

2-2. Note the following flight limitations and restrictions:

MANEUVERS

All standard fighter maneuvers are permitted with any internal loading arrangement except as follows:

Inverted flight—for entering dives or gunnery runs.

Inverted spins—not over one turn.

Normal spins—not over two turns.

When carrying a torpedo, bombs, smoke tank, or droppable fuel tank, the permissible maneuvers are the following:

Wing-over.

Vertical turn.

Inverted flight—for entering a dive.

Aileron roll—for entering a dive.

DIVING SPEED

F6F-3 and -3N

Do not exceed 415 knots IAS below 10,000 feet. Refer to paragraph 2-96, Diving, and figure A-5, for weights, speeds, altitudes and accelerations.

F6F-5 and -5N

With airplane Bureau No. 71098 and subsequent and any F6F-5 or -5N with Model F6 Service Change #75 incorporated do not exceed 440 knots IAS below 10,000 feet. If this change has not been incorporated, the airplane is restricted to limits .5g less or 15 knots less than the limits shown on figure A-6. Refer to paragraph 2-96, Diving, and figure A-6, for weights, speeds, altitudes and accelerations.

USE OF AILERONS

The maximum permissible speed for unlimited use of the ailerons is 260 knots IAS. Accelerations of +5.0g and −2.0g must not be exceeded. At higher airspeeds, use of the ailerons is restricted to the same control force required for full aileron operation at 260 knots IAS.

LANDING GEAR

Maximum speed—raising or lowering—135 knots IAS. If lowered at speeds above 135 knots IAS, the gear will trail.

Maximum speed—gear trailing or extended—300 knots IAS.

Emergency lowering—do not exceed 90 knots IAS.

WING FLAPS

If the electrical flap control system is not operating satisfactorily, reduce speed below 170 knots IAS before lowering flaps. With flaps deflected accelerations of +5.0g and −2.0g shall not be exceeded.

Flaps blow up automatically to the following angles regardless of the cockpit control setting:

50°— 90 knots IAS

15°—150 knots IAS

ENGINE SPEED

Maximum diving rpm—3060 for 30 seconds.

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

2-3. Check gross weight and center of gravity location for take-off and for anticipated landing condition. Loading data is furnished in the Handbook of Weight and Balance Data, AN 01-1B-40.

2-4. ENTRANCE TO AIRPLANE. The cockpit is accessible from either side of the airplane—a step is located on the fuselage aft of the wing trailing edge, and a hand grip above and aft of the wing.

2-5. To open the cockpit, push and hold in the release button on the fuselage skin below the windshield (right hand side) then push the enclosure aft.

2-6. ON ENTERING THE PILOT'S COCKPIT.

2-7. STANDARD CHECK FOR ALL FLIGHTS.

a. Wheels chocked.

b. Control's locking device—OFF.

c. Landing gear control—"DOWN".

d. Ignition switch—"OFF".

e. Wings—SPREAD and LOCKED. Warning signal flags flush with wing skin.

f. Adjust seat height and rudder pedals. Check stick and pedals for freedom of movement and full throw—watch control surfaces.

g. Adjust shoulder harness and rear view mirror.

h. Mixture control—"IDLE CUT-OFF".

i. Battery switch—"ON"

j. Check fuel and oil supply.

k. If rockets are carried and a MK. 3 distributor is installed, remove rocket safety plug located on distributor box. (Refer to Section V.)

l. Check gun sight illumination and ammunition loading. (Refer to Section V.)

m. Gun charging controls—"SAFE". All armament switches—"OFF". (Refer to Section V.)

n. Check communication equipment. (Refer to Section V.)

o. Arresting hook—"IN". Red light OFF.

p. Fuel pressurizing handle—"PRESSURE" position.

q. Check hydraulic system pressure—1250-1500 psi.

r. Check landing gear dump bottle air pressure—1800-1950 psi.

s. Check enclosure emergency release pins for security.

t. Uncage directional gyro and artificial horizon.

u. Set altimeter to correct barometric pressure.

v. Check clock.

w. GR-1 automatic pilot (late model F6F-5N)—DISENGAGED.

x. Oil dilution switch—"OFF".

2-8. SPECIAL CHECK FOR NIGHT FLIGHTS.

a. Battery switch—"ON".

b. Test operation of landing light (night fighters).

c. Chartboard, instruments, and cockpit light rheostats—turn "ON" and adjust to best light.

d. Test operation of the following switches and lights:

Master exterior lights.
Formation lights.
Tail running lights
Wing running lights.
Section light.

e. Test operation of recognition lights. (10 seconds only.)

f. Lower arresting hook to test approach light. Arresting hook—"IN".

2-9. FUEL AND OIL SYSTEM MANAGEMENT.

2-10. OPERATION OF FUEL SYSTEM. The fuel system is managed primarily with the fuel tank selector and auxiliary (emergency) fuel pump switch.

2-11. After warm-up, take-off and a safe altitude has been reached, rotate the tank selector from the right main to wing droppable (left or right) or fuselage droppable depending on which tank or tanks are carried. If fuel pressure drop is indicated on the engine gage unit (fuel pressure dial), it will be accompanied by a drop in engine performance. More than likely the tank being used is empty or nearly so, providing the remainder of the system is functioning normally. Select another tank immediately and turn the auxiliary (emergency) fuel pump switch to "ON". Keep this pump "ON" until the fuel pressure becomes steady.

2-12. The carburetor bleed-back (vapor vent) line returns approximately two gallons per hour to the right main tank. Also, while the fuel transfer system is in operation, fuel is fed to this tank until it contains 81 gallons. Refer to Section I for further information.

2-13. OPERATION OF OIL SYSTEM. The operation of the oil system is automatic except for oil dilution and the setting of the oil cooler shutter. This shutter is controlled by a hydraulic lever on the left hand shelf. Refer to paragraph —.

2-14. During flight, oil temperature can be reduced more rapidly by reducing rpm than by throttling only. Oil temperature and pressure limits are as follows:

Scramble take-off—40°C (104°F) min.
Ground test—40°C (104°F) min.
Desired—60°-85°C (140°-185°F), 75-95 psi
Maximum—95°C (203°F), 100 psi

2-15. OIL DILUTION. During cold weather operation, hard starting of the engine is minimized by using gasoline to thin the oil during the previous stopping of the engine. This is accomplished by operating the oil dilution system, consisting mainly of electrically operated solenoid and diluter valves. A manual shut-off valve, in the oil dilution line, provides protection against the possibility of inadvertent operation of the oil dilution system. This valve is safety-wired in the closing position whenever weather conditions do not require oil dilution. The oil dilution control switch is located on the fuel control panel.

2-16. STARTING ENGINE.

2-17. On starting the engine, proceed as follows:

a. With ignition and battery switches "OFF", manually rotate propeller four or five times. Never rotate engine backwards to clear it.

b. Mixture—"IDLE CUT-OFF".

c. Fuel tank selector—"RIGHT MAIN".

d. Propeller control—FULL "INCREASE RPM".

e. Throttle—ONE INCH OPEN (Approx.)

f. Supercharger—"NEUTRAL".

g. Carburetor air control—FULL IN.

h. Cowl flaps—"OPEN".

i. Oil cooler shutter—position dependent on temperature.

j. Battery switch—"ON".

k. Auxiliary (emergency) fuel pump switch—"ON".

l. Primer switch—"ON" (three to five seconds).

m. Ignition switch—on "BOTH".

n. Starter switch—"ON".

o. Mixture control—advance to "AUTO-RICH" as engine fires. If engine fails to continue running, return to "IDLE CUT-OFF".

p. Idle engine at or below 1000 rpm until oil pressure begins steadying out.

WARNING

If the oil pressure gage does not register within 30 seconds, stop the engine and investigate. Never run oil pressure over 200 psi during warm-up.

2-18. WARM-UP AND GROUND TEST.

2-19. Open the throttle to 1200 rpm until oil-in temperature reaches 40°C range. An increase in oil pressure when the throttle is opened, indicates that further warm-up is required. If the oil dilution system has been used prior to stopping the engine, warm up the engine sufficiently before take-off so that the oil system is operating efficiently.

2-20. CHECK MAGNETOS. Open the throttle to 30 in. hg which will give 2100-2200 rpm in low pitch. Check the functioning of the magnetos by putting the ignition switch in "LEFT". The normal drop-off in rpm is 50 to 75 and should not exceed 100 rpm. Return the switch to "BOTH" until rpm stabilizes then turn to "RIGHT" and note rpm drop-off. Do not operate longer than 15 seconds on a single magneto. This test should be made in as short a time as practicable.

Note

Make this check prior to the IDLE MIXTURE CHECK to make certain that the plugs are not fouled.

2-21. SUPERCHARGER CHECK AND DESLUDGING PROCEDURE. The supercharger check should never be made nor the clutches desludged until the oil temperature has reached 40°C (104°F), and it is preferable to wait until the oil temperature has reached 60°C (140°F). If there is not enough time to complete a regular supercharger check, desludge the clutches twice as directed below.

CAUTION

Always shift from one position to another without hesitation, or at least without dwelling between positions.

a. Adjust the throttle to obtain 1400 rpm with the propeller control in take-off position, then shift from "NEUTRAL" to "LOW".

b. After 30 to 60 seconds in "LOW", shift to "HIGH".

c. After 30 to 60 seconds in "HIGH", open the throttle to 30 in. manifold pressure and note rpm.

d. Shift back to "LOW" and after the manifold pressure has stabilized readjust the throttle to obtain 30 in. manifold pressure. Note rpm.

e. Shift from "LOW" to "NEUTRAL" and again adjust the throttle to obtain 30 in. manifold pressure. Note rpm.

Note

An increase in the engine rpm when shifting from a higher to a lower blower ratio, while maintaining a constant manifold pressure, indicates that the clutches are operating correctly. Less power is required to drive the supercharger in the lower ratios thereby releasing more power to drive the propeller.

f. Desludge the couplings by shifting as directed in paragraphs a., b., and c. above. After a minimum of 30 seconds operation in high blower, move the supercharger control to "NEUTRAL" without any hesitation at the "LOW" position.

2-22. CHECK PROPELLER CONTROL. With the engine turning at approximately 2000 rpm, move the propeller control toward "DECREASE RPM" until a 300 rpm drop is indicated then return control to full "INCREASE RPM". When returned to "INCREASE RPM" position, rpm should be steady and free from surging. The constant speed range of the governor is between 1200 and 2700 rpm.

2-23. If the oil dilution system has been used, take care to see that the propeller pitch charging mechanism is operating properly as the oil operating the hydromatic propeller is not diluted.

2-24. CHECK CARBURETOR IDLE MIXTURE. Set the throttle to obtain 600 rpm—propeller control in full "INCREASE RPM" position. Move the mixture

control lever momentarily, but with a smooth steady pull, to the "IDLE CUT-OFF" position and observe the tachometer for any change in rpm. A momentary rise above 10 rpm indicates too rich a mixture; no change indicates too lean a mixture. A five to ten rpm rise is desired to prevent spark plug fouling at idling speeds and at the same time to afford good acceleration characteristics.

Note

Auxiliary fuel pump should be "ON" for this check.

2-25. CHECK INSTRUMENTS, RUNNING AT 2000 RPM.

a. Oil temperature—60-85°C (140-185°F) desired. (40°C (104°F) minimum).

b. Oil pressure —75-95 psi.

c. Fuel pressure—16-18½ psi. Auxiliary fuel pump switch "OFF" during this check.

d. Cylinder head temperature 100°C (212°F) (desired minimum). Note manifold pressure as a reference for future checks.

e. Hydraulic system pressure—1250-1500 psi.

2-26. GENERATOR SYSTEM CHECK. If an external power source is being used, have the ground crew disconnect it and make the following check:

a. With the engine idling and the battery switch "ON", turn on some electrical load such as lights, instruments, radio, etc.

b. Check the closing of the reverse current cut-out by slowly increasing the engine rpm. The voltmeter reading should increase to the value at which the reverse current relay cut-out closes, which will be indicated by a dip in voltage. This will occur at approximately 26.5 volts.

c. As the engine rpm is further increased, the voltage should rise to about 28.0 and then remain at this value regardless of a further increase in rpm.

d. If the reverse current cut-out fails to close between 26.0 and 27.0 volts or the regulated voltage is not maintained between 27.5 and 28.5 volts, there is trouble in the generator system. The trouble must be corrected before taking off.

2-27. PITOT TUBE HEAT. "ON" if icing conditions prevail.

2-28. DROPPABLE TANKS. With auxiliary fuel pump switch "ON", check fuel flow from each drop tank. Return fuel tank selector to "MAIN" at end of check and leave fuel pump switch "ON".

WARNING

Do not change tanks just before take-off. Allow several minutes ground run after change.

2-29. AUTOMATIC PILOT CHECK.

2-30. In order to insure that it is functioning properly, check its operation in the following manner:

a. Run engine at 1500 rpm (minimum) for full vacuum.

b. Bank and climb gyro—"UNCAGED".

c. Directional gyro—"UNCAGED".

d. Center stick and pedals then engage automtatic pilot by pulling the ON-OFF control "T" handle to "ON". The controls should jar slightly as the unit engages, indicating proper synchronization. The aileron and elevator controls should remain in position. The rudder can be centered with the directional gyro caging knob. As the airplane is not level (three-point position), the horizon bar of the bank and climb gyro will move slowly toward the correct indication of the attitude of the airplane and cause the elevator and aileron controls to follow.

e. Check for direction of control movement by manipulating the controller lever. Observe the direction of the control stick and surface controls movement to ascertain that each control surface moves in the proper direction.

CAUTION

Be careful that the tail of the airplane does not rise from the ground when checking the dive control.

f. Depress straight-course button on controller lever, then cage directional gyro and turn caging knob slowly to the left and right—rudder should move accordingly. After this check, reset and uncage gyro.

2-31. CENTRALIZED POSITION CHECK (ELECTRICAL SYSTEM CHECK). Move the control stick to a position other than "NEUTRAL" then pull the ON-OFF control "T" handle to "CENTRALIZED". The electrical system should return the control stick to a neutral position.

2-32. OVER POWER CHECK. Check to be sure that the automatic pilot can be over powered with the ON-OFF control handle in the "ON" position. After this check, disengage the automatic pilot by pushing ON-OFF control handle to "OFF".

2-33. SCRAMBLE TAKE-OFF.

2-34. An emergency take-off may be made in accordance with the regular take-off procedure provided that:

a. Oil pressure is steady.

b. Oil temperature—at least 40°C (104°F).

c. Throttle may be advanced without causing the engine to cough or cut-out. Engine acceleration should be smooth.

2-35. TAXIING INSTRUCTIONS.

2-36. Taxi with the tail wheel unlocked except in strong cross winds. A steady run of the engine is preferable to repeated short bursts of power. Set cowl flaps in FULL "OPEN" position. Use the brakes to help guide the airplane but avoid riding them to prevent overheating.

2-37. TAKE-OFF.

2-38. CLEAR ENGINE. It is necessary to clear the engine at high power immediately before take-off.

2-39. CHECK-OFF LIST.

a. Obtain traffic clearance.

b. Enclosure—"OPEN".

c. Shoulder harness—TIGHT.

d. Wings—SPREAD and "LOCKED". Red warning cylinders flush with wing skin.

e. Cowl flaps—½ "OPEN" (approx).

f. Oil cooler and intercooler shutters—"OPEN" (F6F-3 and -3N). Oil cooler shutter—"OPEN" (F6F-5 and-5N). Intercooler shutters—"CLOSED" (F6F-5 and -5N).

g. Carburetor air control FULL IN—"DIRECT". If icing conditions exist, use "PROTECTED AIR" to clear engine, then switch to "DIRECT" for take-off.

h. Propeller control — FULL "INCREASE RPM" (2700).

i. Mixture control—"AUTO RICH".

j. WEP switch—"OFF".

k. Supercharger control — "NEUTRAL" (regardless of airport altitude).

l. Fuel tank selector—"RIGHT MAIN".

m. Auxiliary fuel pump—"ON".

n. Tab control settings: aileron—0; elevator—0; rudder—2 marks "NOSE RIGHT". (With normal airplane loading).

o. Wing flaps—"UP" or "DOWN" as required.

p. Tail wheel—"LOCKED", land—"UNLOCKED," carrier.

q. Cockpit heater switch—"OFF" (installed in early model airplanes).

r. Automatic pilot—DISENGAGED (late model F6F-5N).

s. Throttle—open smoothly to 54 in. hg max.

t. Raise landing gear immediately after becoming airborne.

u. Raise flaps.

v. Adjust power plant according to the Power Plant Chart, Section III.

2-40. CATAPULT CHECK-OFF LIST.

a. Enclosure—"OPEN" and STOPPED.

b. Shoulder harness—TIGHT.

c. Place back and head firmly against seat and headrest.

d. Place feet against rudder pedals with legs stiff.

e. Brace right arm.

f. Wing flaps—FULL "DOWN".

g. Check tab control settings.

h. Throttle and propeller levers friction should be sufficient to prevent controls from moving if hand is removed.

i. Use full take-off power—54 in. hg and 2700 rpm.

2-41. ENGINE FAILURE DURING TAKE-OFF.

2-42. If the engine fails during the take-off, proceed as follows:

a. Nose down to maintain flying speed.

b. Shoulder harness—TIGHT.

c. Jettison external load items. Safe armament units before release.

d. Check that landing gear control is in "UP" position, if landing gear does not have time to retract it will collapse upon landing.

e. After making certain that the selected field can be reached, lower the wing flaps, and if time permits:

f. Ignition switch—"OFF".

g. Battery switch—"OFF".

h. Mixture control—"IDLE CUT-OFF"

i. Fuel selector control—"OFF".

2-43. CLIMB.

2-44. Refer to Section III and Appendix for flight operation instruction charts, ranges, and recommended power settings.

2-45. RATED POWER CLIMB.

a. Mixture control "AUTO LEAN" (leave in "AUTO RICH" after take-off until climbing IAS is attained).

b. Cowl flaps—⅓ "OPEN" (approx).

c. Do not exceed 260°C (500°F) cylinder head temperature.

2-46. SEA LEVEL TO 7000 FEET.

a. "NEUTRAL" blower.

b. 2550 rpm.

c. Use 44 in. manifold pressure (but not more), below full throttle.

d. Hold IAS constant at 140 knots.

2-47. 7000 TO 22,000 FEET.

a. "LOW" blower.

b. 2550 rpm.

c. Use 49.5 in. manifold pressure (but not more) below full throttle.

d. Hold IAS constant at 140 knots.

2-48. 22,000 FEET AND UP.

a. "HIGH" blower.

b. 2550 rpm.

c. Use 49.5 in. manifold pressure (but not more) below full throttle.

d. Hold IAS constant at 140 knots.

2-49. The IAS may vary five knots over or under 140 knots IAS without appreciably affecting the rate of climb. If cooling is not adequate, increase IAS as much as 10 knots before opening cowl flaps further. Increase IAS as required to maintain adequate cooling rather than open cowl flaps more than one-half. If stubborn overheating is encountered, and it refuses to yield to other methods of control, shift the mixture control to "AUTO RICH."

2-50. When maximum rate of climb is not essential, better cooling will be obtained if the IAS is increased 10 to 20 knots over the IAS for maximum rate of climb as the resulting loss in rate of climb will be small.

2-51. CRUISING CLIMB.

a. Mixture control "AUTO LEAN".

b. Cowl flaps "CLOSED".

c. Do not exceed 232°C (450°F) cylinder head temperature.

2-52. SEA LEVEL TO 12,000 FEET.

a. "NEUTRAL" blower.

b. 2050 rpm.

c. Use 34 in. manifold pressure (but not more) below full throttle.

d. Maintain 150 knots IAS with **both clean and overloaded fighters.**

2-53. 12,000 TO 25,000 FEET.

a. "LOW" blower.

b 2050 rpm.

c. Use 34 in. manifold pressure (but not more) below full throttle.

d. Maintain 150 knots IAS with **both clean and overloaded fighters.**

2-54. 25,000 FEET UP.

a. "HIGH" blower.

b. 2050 rpm.

c. Use 34 in. manifold pressure (but not more) below full throttle.

d. Maintain 150 knots IAS (with both clean and overload fighters).

2-55. Normally no opening of the cowl flaps should be necessary during climbs at cruising power. If cooling is inadequate try increasing IAS before resorting to use of cowl flaps. If stubborn overheating is encountered, and it refuses to yield to other methods of control; shift the mixture control to "AUTO RICH". Use of "AUTO RICH" should be avoided whenever possible because of the increased fuel consumption.

2-56. GENERAL FLYING CHARACTERISTICS.

2-57. STABILITY. The airplane is stable at all normal loadings.

a. Lowering of the landing gear tends to make the airplane slightly nose-heavy.

b. Lowering of the wing flaps tends to make the airplane nose-heavy.

2-58. AIRSPEED AND ACCELERATION RESTRICTIONS.

2-59. The speed and acceleration limits in the Appendix, figure A-5 or A-6, are largely determined by the fact that as these limits are approached, a buffeting or shaking of the airplane is likely to be encountered. If this becomes appreciable, immediately reduce speed or acceleration or both. Exceeding these limits will very probably be evidenced by permanent distortion or possibly by failure of the horizontal stabilizer. It is therefore, of the utmost importance that pilots avoid exceeding these limits. In general, the shaking phenomenon occurs at lower indicated airspeeds at higher altitudes as shown in figure A-5 or A-6. Pilots must also be on the alert to avoid steep dives at extreme altitudes because such dives will result in excessive speeds, which will in turn produce compressibility effects with their attendant dangers.

2-60. USE OF AILERONS. The maximum speed for unlimited use of the ailerons is 270 knots (F6F-5 and -5N) and 260 knots (F6F-3 and -3N) IAS. At higher speeds, use of the ailerons is restricted to the same control force required for full aileron operation at the above speeds for the respective models. Also maximum use of the ailerons is limited to accelerations of not over 5.0 g positive and 2.0 g negative.

2-61. OPERATION WITH 11.75 IN. AR. The following operational data is the result of Navy Service Tests. The airplane should be flown in the following manner with these rockets installed:

WARNING

High wing loadings, high stalling speeds, low rates of climb, loss of maneuverability, and marginal rudder control in the carrier approach condition at weights above 16,000 lbs require that a very careful indoctrination period be followed.

a. All take-offs should be made with full flap deflection (16,000 lbs gross weight).

b. Trim tab settings for take-off: elevator—1° "NOSE DOWN"; ailerons—"NEUTRAL"; and rudder —30° "RIGHT".

c. Following take-off at high gross weights, it is necessary to hold hard right rudder pressure until the flaps are raised even though full right rudder tab is used.

d. At high gross weights above 16,000 lbs and low speeds, it becomes difficult to bring a wing up with the rudder. Also considerable rudder must be used to maintain straight flight.

e. Restrict all maneuvers to gentle turns until a safe speed and altitude are reached.

f. Stalling characteristics are satisfactory. However, with either a 100 or 150 gallon drop tank installed on the port wing and one 11.75 in. AR on the starboard wing, the power-on stall in the landing condition is followed by a roll to the right. Altitude required for recovery from a stall increases rapidly with increasing gross weight, becoming approximately 1000 feet at a gross weight of 17,164 lbs.

WARNING

Carrier landings with these rockets installed should be confined only to emergencies. Under no circumstances should the airplane be landed with a rocket installed on only the port wing rack.

g. The airplane may be landed in an emergency in the following configurations at gross weights up to 14,300 lbs.

One 11.75 in. AR—starboard wing rack.

Two 11.75 in. AR—one on each wing rack.

One 11.75 in. AR—fuselage rack.

h. With a rocket installed on the starboard wing rack, full left rudder trim and full left wing down trim are insufficient to maintain level flight at 80 knots IAS. Full left aileron is required from cut to landing.

i. With two rockets installed, one on each wing rack, the airplane is comfortable in the carrier approach down to a minimum of 80 knots IAS, but drops in hard after the cut.

2-62. CRUISING.

2-63. Unless there is an urgent reason for using higher powers, it is recommended that all cruising be done at "maximum cruising" power or lower. Use of higher powers will exact a penalty in the form of increased fuel consumption and reduced engine life and reliability. For maximum cruising power, use the rpm—manifold pressure combinations shown on the Engine Calibration Curves, figure A-7.

2-64. For lower cruising power—observe the following rules:

2-65. RULE FOR CRUISING. Maintain 34 in. manifold pressure (but not more) or full throttle, if above critical altitude. Control IAS by adjusting rpm. Do not exceed 2050 rpm in "NEUTRAL" "LOW" or in "HIGH" blowers.

Do not use less than 1300 rpm. (If spark plug fouling occurs at 1300 rpm in cold weather, increase rpm enough to stop fouling.) If IAS obtained at 34 in. hg and minimum rpm is too high, reduce manifold pressure as necessary. Otherwise, do not use less than 34 in. below critical altitude. Use "AUTO LEAN" at all times unless shift to "AUTO RICH" is necessary to control head temperature. Do not exceed 232°C (450°F) cylinder head temperature. Do not open cowl flaps, or oil cooler and intercooler shutters unless temperatures approach limits.

2-66. RULE FOR OBTAINING MAXIMUM RANGE. Observe rule for cruising, and maintain 145 knots IAS (constant) regardless of airplane configuration. Fly at lowest feasible altitude. A small gain will result if IAS is changed to compensate for wind. If this refinement is desired, increase IAS five knots for each ten knots of headwind until IAS reaches 150 knots. Do not exceed 160 knots IAS, regardless of wind force. Do not compensate for tailwinds.

2-67. RULE FOR OBTAINING MAXIMUM ENDURANCE. Observe rule for cruising, and maintain 125 knots IAS (constant) regardless of airplane configuration. If mushiness is felt when gross weight is high, increase IAS slightly. Fly at lowest feasible altitude.

2-68. WAR EMERGENCY POWER. War emergency ratings have been established to permit operation at the highest power, within reasonable safety limits, that the structural limitations of the engine will permit.

2-69. When the throttle is advanced beyond the limit stop to full forward position, it closes a micro-switch which controls the water supply to the engine. When the micro-switch is closed, three things occur:

a. Water pressure shuts off a fuel jet in the carburetor, "de-riching" the mixture to approximately best-power.

b. Water pressure resets the auxiliary stage supercharger regulator for approximately 3.5 in. hg higher carburetor inlet pressure.

c. Water is metered and mixed with the fuel.

2-70. Before using WEP, close the water pump toggle switch located on the left hand cockpit shelf. The water pump will then clear the lines of air, and build up water pressure behind the micro-switch controlled solenoid valve.

2-71. With the power controls set for military power (see Power Plant Chart, figure 3-2), advance the throttle past the limit stop to full forward position. If in "NEUTRAL" blower, the manifold pressure should rise immediately to not over 60 in., and a second or two later, a surge of power should be felt. If in "LOW" or "HIGH" blower, the manifold pressure rise and power surge may occur more nearly at the same time.

CAUTION

Continuous operation at WEP should not exceed five minutes.

2-72. If "LOW" or "HIGH" blower is being used, the engine will automatically return to military power when the water supply is exhausted. When operating in "NEUTRAL" blower, the auxiliary stage regulator cannot control the manifold pressure *and the throttle must be brought back behind the limit stop immediately when the water has been exhausted.* Failure to observe this rule may result in serious engine damage, or total failure, within a few seconds. The water pump switch should be placed in "OFF" position as soon as the water supply is exhausted. The pump is not designed for dry running.

2-73. If the engine fails to respond within two or three seconds after the throttle is advanced for WEP, return the throttle to setting for military power immediately.

2-74. WEP is intended for combat use only, and should not be used at any other time, except during familiarization. The limited supply of water that can be carried should be conserved like ammunition, because it may last none too long when really needed. Although there should be no hesitation in using WEP for maximum effect during combat, pilots should be alert to the fact that engine life is shortened considerably by operation at this power, and should be on the lookout for signs of lessened performance or reliability.

Note

If the pilot is flying above the critical altitude for any blower setting, water injection will have a negligible effect on engine power.

2-75. MANIFOLD PRESSURE SWITCH. Airplanes BuAer No. 10801 and subsequent, are equipped with an electrically operated manifold pressure switch connected in parallel with the engine throttle microswitch. This manifold pressure switch closes the water regulator solenoid valve circuit when manifold pressure reaches 45 in. hg and opens the circuit when pressure falls below 51 in. hg thus allowing a gradual reduction in horsepower when the throttle is moved AFT from the FULL FORWARD position.

2-76. GENERATOR SYSTEM CHECK. At regular intervals during flight, the generator system should be checked by turning the battery switch "OFF". If the electrical loads remain in operation and the voltmeter readings are between 27.5-28.5 volts, the generator is functioning properly. Put battery switch back to "ON" position.

2-77. SUPERCHARGER OPERATION.

2-78. There are inherent characteristics of the auxiliary blower engaging system on two-stage engines that may sometimes cause cutting out or other irregular operation while the blowers are shifting. This condition is beyond the pilot's control, but the use of the procedure outlined below will result in a minimum of manifold pressure surge, rpm surge, and cutting out during blower shifts from a lower to a higher ratio.

a. Shift the blower selector lever to the desired new blower ratio position without reducing rpm.

b. Wait for the first indication of the manifold pressure to pick up.

c. Quickly retard the throttle to about $\frac{2}{3}$ open. (This $\frac{2}{3}$ open position will hereafter be referred to as the "surge control position".) After the blower has become fully engaged (about 15 to 20 seconds after repositioning the blower selector lever), the throttle may be opened to maintain the desired manifold pressure.

Note

If the engine is already operating with the throttle at or near the "surge control position" when the shift is made, it will not be necessary to retard the throttle further. If the engine is operating at a throttle position which is less than the "surge control position", it is best to open the throttle to the "surge" control position before shifting.

2-79. After a few practice shifts, the pilot will find himself familiar with the feel of the throttle while shifting so that he will be able to make the shift with a minimum of discomfort.

2-80. When operating at powers below 1900 rpm and 30 in. hg, it is not necessary to retard the throttle after repositioning the blower selector lever as the manifold pressure surge will be much smaller.

2-81. If the auxiilary stage is operating and it is desired to shift to a lower blower ratio, move the blower selector lever to the desired lower blower ratio position. It is not necessary to change either the throttle position or the engine speed during this process. Blowers may be shifted down from high to low, high to neutral, or low to neutral. Usually there is a smooth surgeless transition of power as the blower ratio decreases. However, it is possible that the engine may cut out momentarily if the blower ratio is shifted from high to neutral at altitudes above 20,000 ft. after considerable high power operation in high blower.

CAUTION

In flight do not shift into the same ratio at intervals of less than five minutes, except in an emergency. This allows sufficient time for dissipation of heat from the clutches which is generated during the shift. When in the higher blower ratios, avoid unduly high rates of change in engine speed to prevent excessive loads on the clutches and supercharger drive.

2-82. When climbing at WEP in neutral or low blower, it is not necessary to retard the throttle after shifting to a higher blower ratio. The whole auxiliary blower system is working at such a high percentage of its capacity at WEP that the manifold pressure does not surge beyond 60 in. hg.

CAUTION

Shifts at WEP shall be made only during an emergency.

2-83. CHANGING POWER CONDITIONS. In order to prevent excessive pressures within the cylinders when changing power, the following procedures shall be used:

a. INCREASING ENGINE POWER. Adjust propeller control to desired rpm, then adjust the throttle to obtain the desired manifold pressure.

b. DECREASING ENGINE POWER. Adjust the throttle to obtain the desired manifold pressure, then adjust the propeller control to the desired rpm.

2-84. AUTOMATIC PILOT ENGAGEMENT. Until thoroughly familiar with its operation, the automatic pilot should not be engaged before a reasonable altitude (2000 feet approximately) has been attained. After complete familiarization, the pilot may be engaged after take-off.

a. Trim airplane for hands-off level flight.

Note

The automatic pilot, being self-synchronous, will take control and maintain the existing flight attitude at the moment of engagement within its operating limits: Bank — 45°, Climb—30°, and Dive—50°.

b. Set the direction gyro card for heading. Engage the pilot by pulling the ON-OFF control "T" handle to "ON". By holding the controls as the pilot is engaged, you will feel when it is flying the airplane.

c. At the time of application of the "T" handle to "ON", the pilot will take control and maintain the existing flight attitude of the airplane until an attitude change is effected by the controller lever; or until the automatic pilot is overpowered by operating the airplane controls.

d. To make coordinated turns, push controller lever to the left or right as desired and hold until the desired rate of turn is obtained then release. This automatically disengages the straight course feature. In order to resume a straight course again, momentarily press the controller lever button after the airplane is set on the new course.

e. To bank without turning, push the controller lever to the left or right while depressing the button. Hold lever and button in position only until desired angle of bank is obtained (limit—30°).

f. To climb, pull maneuvering lever aft. Hold lever in position until desired angle of climb is obtained (limit—30°).

g. To dive, push maneuvering lever forward. Hold lever in position until desired angle of dive is obtained (limit—50°).

h. To return to level flight automatically, pull ON-OFF control "T" handle to "CENTRALIZED". Hold until level flight or desired recovery angle is attained. The airplane will automatically return to straight and level flight from attitudes within the limits of the gyroscopes of the automatic pilot.

i. To overpower the automatic pilot, apply approximately twice the normal force on the airplane controls.

2-85. PERIODIC FLIGHT CHECK.

a. Check how closely the flight attitude is held. Check for hunt by inducing transients in the elevator and ailerons.

b. Hold a selected heading for a minimum of 10 minutes. Check for drift, left or right, maximum ±1°.

c. During banks to left and right, rate of roll should be approximately 5° per second. Check for smoothness of roll and rudder coordination.

d. Check operation in a climb to 100 knots and dive to 280 knots. Check combined climb and bank, and dive and bank.

e. "CENTRALIZE" from bank, climbing turn and diving turn. Limits after recovery are 800 feet per minute climb or glide.

f. Overpower manually all controls. Note return to original attitude. Also note any tendency toward oscillation of the controls.

Note

1

At periodic intervals, correct for directional gyro drift in the conventional manner.

2

Keep gyros uncaged at all times except when leveling the bank and climb control or resetting the directional control.

3

Keep the airplane approximately in trim. Check at such times when the airplane is being flown manually.

4

During turns, correct for loss of altitude due to bank and climb gyro turn error by using controller lever.

5

In icing conditions, disengage the pilot frequently and move the controls manually to see that they are free.

6

For corrections in excess of 2°, disengage the directional control by momentarily flicking the controller lever to the side. Rudder to the new heading and then depress directional (lock) button momentarily to maintain new heading.

2-86. STALLS.

2-87. The stalling characteristics of this airplane are very satisfactory. As the stall approaches, the right wing tends to drop slowly and a severe quivering is felt throughout the airplane. The stalling speeds are given on figure A-3, Appendix.

2-88. SPINS.

2-89. Normal spins of not over two turns and inverted spins of not over one turn are permitted. With the airplane loaded to 11,250 lbs. and with the cg position at 26.0%, spins of four turns have been investigated. A normal entry was made with ailerons one half against the spin.

2-90. RIGHT SPIN.

a. Nose drops to 50-60° angle.

b. Aileron forces negligible.

c. Nose oscillation same frequency as the rate of rotation of airplane.

2-91. RECOVERY.

a. After 4¼ turns, full rudder reversal was made followed about one second later by full elevator reversal. The spin steepened sharply and the rate of rotation appeared to double. Rudder forces were relatively light, elevator forces were moderately heavy, aileron forces were fairly heavy.

b. Recovery effected in 1½ turns and level flight attained.

c. Loss of altitude 5000 feet.

2-92. LEFT SPIN.

a. Nose drop not as steep as in right spin.

b. Aileron forces are heavier.

c. Nose oscillations are of greater amplitude.

2-93. RECOVERY.

a. After four turns recovery was effected in 1¾ turns.

b. Aileron and elevator forces about double those experienced in right spin; rudder forces about the same.

c. Loss of altitude 4400 feet.

2-94. PERMISSIBLE ACROBATICS.

2-95. All acrobatics with the exception of those listed in paragraph 2-2 may be performed. However, before starting any acrobatics or violent maneuvers, cage the directional gyro and the artificial horizon. Disengage the GR-1 automatic pilot (later model F6F-5N).

2-96. DIVING.

2-97. For ordinary short dives in maneuvers, the engine nose section will not load up nor will the engine cool off to any extent. The controls should be set as follows:

a. Canopy—CLOSED.

b. Supercharger control—"NEUTRAL" or "LOW" depending on altitude.

c. Set propeller control—2050-2250 rpm.

d. Cowl flaps—"CLOSED".

e. Oil cooler and intercooler shutters—"CLOSED".

2-98. For prolonged dives to avoid loading up the engine nose section or cooling the engine excessively:

a. Set the propeller control to maximum cruising—2250±100 rpm.

b. Set throttle—15 in. hg manifold pressure(minimum).

c. Mixture control—"AUTO RICH".

2-99. MAXIMUM DIVING RPM—3060 FOR 30 SECONDS.

2-100. In the event that overspeeding beyond the overspeed limit of the engine occurs, the following procedure is recommended:

a. Throttle to "CLOSED".

b. Propeller to "DECREASE RPM".

c. Reduce airspeed to minimum speed for safe glide.

2-101. NIGHT FLYING.

2-102. Proceed as follows:

a. Wear red goggles for one half hour before each flight.

b. Avoid all light (searchlights, flares, etc.) as much as possible, except red light.

c. Do not look at lighted instruments longer than necessary even though light is red.

d. Practice "blindfold drills" until all controls can be operated with ease in the dark.

e. Scan the sky systematically, moving the eyes over small areas at a time. Do not stare. Learn to look for night targets out of the corners of the eyes.

f. Use oxygen for all night flights.

g. Learn to look for and identify objects solely by contrast (light and shadow).

2-103. APPROACH AND LANDING.

2-104. The approach and landing may be made with or without power. Reduce speed during initial circuit to approximately 120 knots IAS and then prepare for landing as follows:

2-105. CHECK-OFF LIST.

a. Enclosure—"OPEN"—STOPPED.

b. Shoulder harness—TIGHT.

c. Tab control settings—as required.

d. Auxiliary fuel pump—"ON".

e. Fuel selector valve—BEST TANK.

f. Mixture control—"AUTO RICH".

g. Propeller—"INCREASE RPM"—2250-2450 rpm.

h. Supercharger—"NEUTRAL".

i. Cowl flaps—"OPEN".

j. Oil cooler and intercooler flaps—"OPEN".

k. Tail wheel caster—"LOCKED" for land operation and "UNLOCKED" for carrier operation.

l. Arresting hook extended (carrier operation).

m. Safety guns—master armament switch—"OFF".

n. Rocket safety plug (MK 3 unit)—REMOVE.

o. Wing flaps—"DOWN".

2-106. The landing characteristics of this airplane are excellent. The landing speeds will vary according to the loading conditions of the airplane. At the conclusion of the land run:

a. Wing flaps—"UP".

b. UNLOCK tail wheel before taxiing for land operation.

c. Cowl flaps "OPEN".

d. Oil cooler—intercooler flaps—as required.

2-107. STOPPING ENGINE.

2-108. The following procedure shall be followed when stopping the engine:

a. Propeller control—full "INCREASE RPM".

b. Throttle set at approximately 1400 rpm.

c. Shift supercharger controls remaining in each position for approximately 30 seconds for de-sludging blowers (see paragraph 2-21).

d. Operate engine at 1000-1200 rpm to cool if operation has been set at high powers.

e. Auxiliary fuel pump—"OFF".

f. Put mixture control to "IDLE CUT-OFF".

g. Put ignition switch in "OFF" position after propeller stops rotating.

h. Place fuel selector in "OFF" position.

i. Battery switch—"OFF".

j. Leave cowl flaps—"OPEN" until engine cools.

k. Install surface controls lashing device if airplane is to remain grounded.

2-109. OIL DIULTION PROCEDURE. If cold weather starting (temperature below—2°C (-35°F) is anticipated, the oil dilution system should be operated as follows:

a. Oil dilution shut-off valve—OPEN.

b. Engine speed—1000 rpm.

c. Oil dilution switch "ON" for approximately two minutes.

d. Oil-in temperature not more than 40°C (140°F.)

Note

When the solenoid valve is opened by the switch action, there willl be a sharp drop in indicated fuel pressure. Fuel pressure should return to normal immediately after closing the valve. If not, stop the engine at once and check for valve leakage.

d. Stop engine by moving mixture control to "IDLE CUT-OFF".

e. Ignition switch—"OFF".

f. When the cold engine is subsequently started, and after running a short time the oil pressure starts to fluctuate or drop, the dilution switch shall be held "ON" intermittently for intervals of a few seconds over a period of approximately fifteen seconds. If the oil pressure still does not steady out, stop the engine and wait for approximately five minutes before attempting another start.

2-110. BEFORE LEAVING PILOT'S COCKPIT.

2-111, Install the controls locking device. Refer to paragraph 1-106.

2-112. Check that all switches are in the "OFF" position except the generator switch.

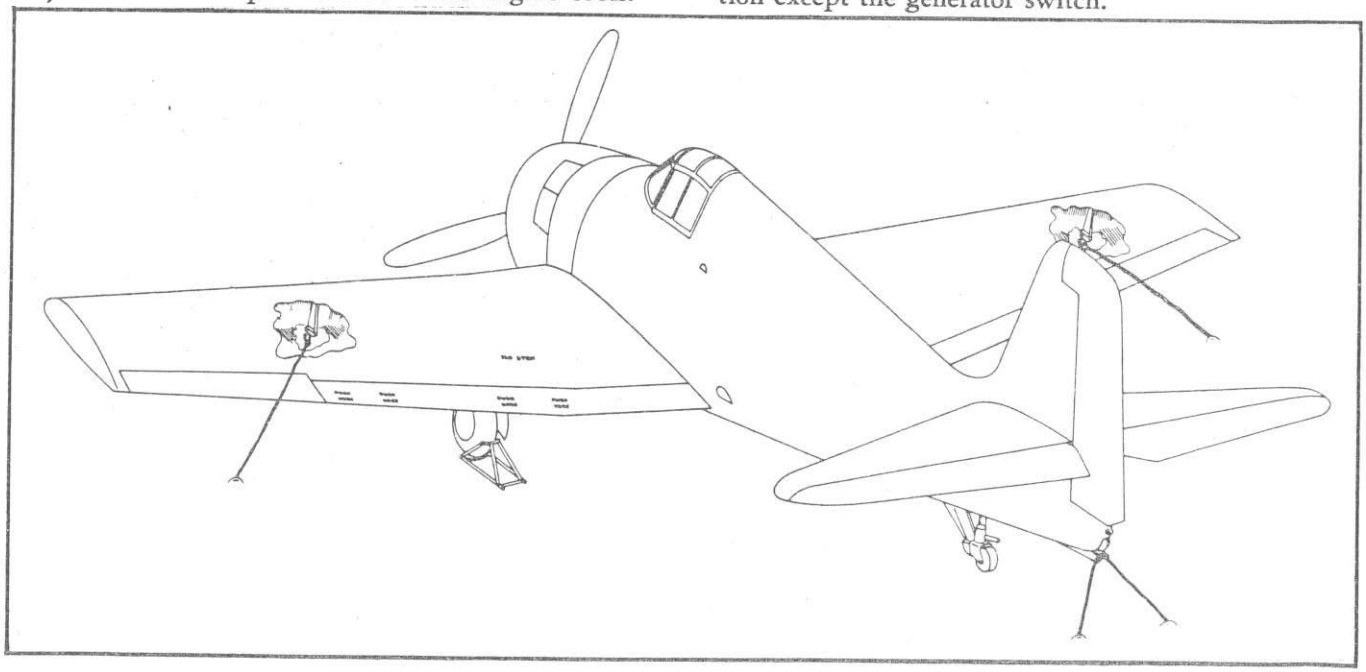
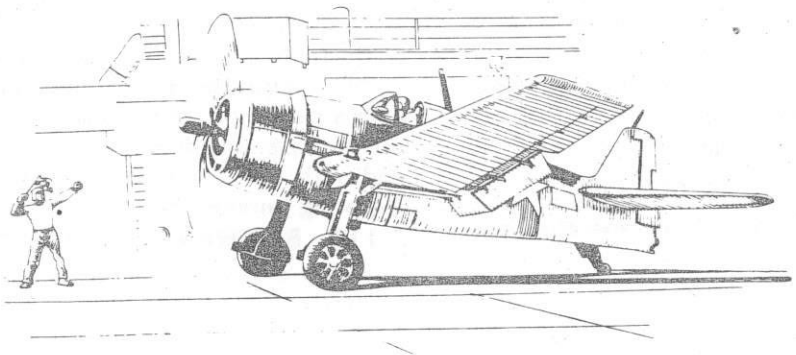
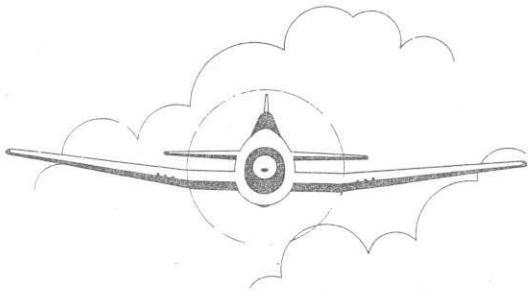


Figure 2-1. Mooring Diagram

2-113. MOORING.

2-114. The airplane may be moored with the wings in the spread position or in the folded position. To moor the airplane with wings spread, attach ropes to the tie-down rings located in the wing outer panels between Stations #159½ and #168. Secure the tail of the airplane by attaching a rope to the catapult holdback fitting and place chocks at the main wheels, if available. If not, then secure main wheels by placing ropes through the nutcracker fittings. To moor the airplane on a carrier deck with the wings in folded position, attach three lines to each main shock strut just below the lowest wheel fairing clamp and secure one line forward, one aft, and one outboard to the carrier deck. Lash the tail of the airplane to the deck by attaching a line to the rear catapult fitting.





SECTION III
OPERATING DATA

PITOT STATIC ORIFICE LOCATED IN FUSELAGE SKIN AT STATION #97			PITOT STATIC ORIFICE LOCATED AT WING TIP		
IAS *(Knots)*	*Correction (Knots)*		IAS *(Knots)*	*Correction (Knots)*	
FLAPS UP			FLAPS UP		
120	Deduct	2.5	100	Add	4.5
140	Deduct	2.5	120	Add	4.5
160	Deduct	4.5	140	Add	6.0
180	Deduct	4.5	160	Add	7.0
200	Deduct	4.5	180	Add	7.0
220	Deduct	4.5	200	Add	8.0
240	Deduct	4.5	220	Add	9.0
260	Deduct	3.5	240	Add	9.0
280	Deduct	3.0	260	Add	10.5
300	Deduct	2.5	280	Add	11.5
			300	Add	11.5
FLAPS DOWN			FLAPS DOWN		
100	Deduct	6.5	95	Add	6.5
110	Deduct	8.0	100	Add	6.5
120	Deduct	9.0	110	Add	7.0
130	Deduct	9.5	120	Add	7.0
140	Deduct	11.5	130	Add	7.5
			140	Add	7.5

Figure 3-1. Airspeed Installation Correction Tables

POWER PLANT CHART

AIRCRAFT MODEL(S)	PROPELLER(S)	ENGINE MODEL(S)
F6F-3, F6F-3N F6F-5, F6F-5N	Hamilton Standard - 3 blade Hydromatic 6501A - 0/2E50 -495	R-2800-10 R-2800-10W

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.	COOLANT TEMP.		OIL(1) CONS.
DESIRED MAXIMUM	17 18.5	90 100	70 100			
MINIMUM IDLING	16 7	60				

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

OIL GRADE: (S)1120 (W) Spec-AN-V-08
FUEL GRADE: 100/130; Spec. AN-F-28

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
5 MINUTES			30 MINUTES			TIME LIMIT			UNLIMITED			UNLIMITED		
260°C			260°C			MAX. CYL. HD. TEMP.			260°C					
Auto Lean 2700(4)			Auto Lean 2700			MIXTURE R. P. M.			Auto Lean 25.50			Auto Lean 2200 N 2150 L & H		
MANIF. PRESS.	SUPER-CHARGER	FUEL(2) Gal/Min	MANIF. PRESS.	SUPER-CHARGER	FUEL(2) Gal/Min	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH (3)	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH (3)
						-55.0 -55.0 -56.0	40,000 FT. 38,000 FT. 36,000 FT.	-67.0 -67.0 -67.0						
						-52.4 -48.4 -44.4	34,000 FT. 32,000 FT. 30,000 FT.	-62.3 -55.1 -48.0	FT	H	122	Ft	H	85
FT FT FT	H H H	2.3 2.7 3.0	(Use normal rated power See Note (4)			-40.5 -36.5 -32.5	28,000 FT. 26,000 FT. 24,000 FT.	-40.9 -33.7 -26.5	FT FT FT	H H H	150 190 180	FT FT FT	H L L	93 82 89
FT FT 58	H H(4) H(4)	3.2 3.5 3.6	FT FT 53	L L L	3.3 3.5 3.7	-28.6 -24.6 -20.7	22,000 FT. 20,000 FT. 18,000 FT.	-19.4 -12.3 - 5.2	49.5 FT 49.5	H L L	178 200 208	36 36 36	L L L	96 95 94
FT 58 58	L L L	3.6 3.7 3.6	53 53 53	L L L	3.7 3.7 3.7	-16.7 -12.7 - 8.8	16,000 FT. 14,000 FT. 12,000 FT.	2.0 9.1 16.2	49.5 49.5 49.5	L L L	208 208 208	36 36 36	L L L	93 91 90
58 58 58	L L L	3.6 3.6 3.6	53 53 53	L L L	3.7 3.7 3.7	- 4.8 - 0.8 3.1	10,000 FT. 8,000 FT. 6,000 FT.	23.4 30.5 37.6	49.5 49.5 FT	L L N	208 208 170	FT 37 37	N N N	88 96 92
58 58 FT	L L N	3.6 3.6 3.7	FT FT 54	N N N	3.4 3.5 3.7	7.1 11.0 15.0	4,000 FT. 2,000 FT. SEA LEVEL	44.7 51.8 59.0	44 44 44	N N N	162 156 150	37 37 37	N N N	88 84 80

GENERAL NOTES

(1) OIL CONSUMPTION: MAXIMUM U.S. QUART PER HOUR PER ENGINE.
(2) *Gal/Min:* APPROXIMATE U.S. GALLON PER *MINUTE* PER ENGINE
(3) GPH: APPROXIMATE U.S. GALLON PER HOUR PER ENGINE.
F.T.: MEANS FULL THROTTLE OPERATION.
VALUES ARE FOR LEVEL FLIGHT WITH RAM.

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

TAKE-OFF CONDITIONS: 2700 RPM
54" manifold pressure. Auto Rich mixture
260°C max. cyl. head temp.

CONDITIONS TO AVOID:

SPECIAL NOTES

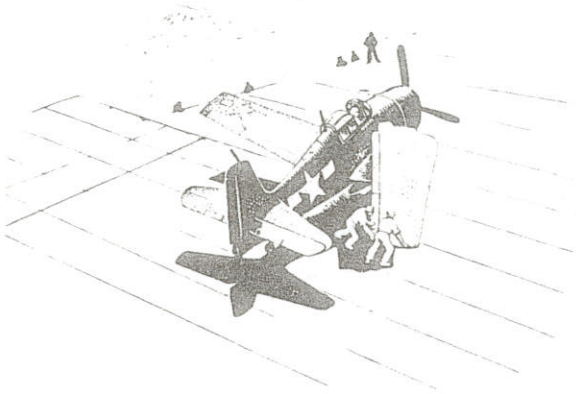
(4) Do not exceed 2550 RPM in high blower.

(5) Use Auto Rich mixture if cylinder head temperature exceeds above limits in Auto Lean.

AAFMC-526
8-1-45

DATA AS OF 7-11-45 BASED ON Naval Air Test Center, Flight Test.

Figure 3-2. Power Plant Chart



SECTION IV
EMERGENCY OPERATING INSTRUCTIONS

4-1. FIRE.

4-2. In case of fire, the controls should be operated as follows:

a. Fuel selector valve—"OFF".

b. Throttle—"OPEN" to consume fuel in carburetor.

c. Oil cooler and intercooler shutters—"OPEN".

d. Cowl flaps—"OPEN".

4-3. ENGINE FAILURE DURING FLIGHT.

4-4. Check tank selector valve, auxiliary fuel pump, and fuel quantity gages as failure may be due to an empty tank.

4-5. FORCED LANDING.

4-6. ON LAND. If it is necessary to make a forced landing on land, proceed as follows:

a. Nose down to maintain flying speed.

b. Jettison external load items—"SAFE" armament units before releasing.

c. Shoulder harness—TIGHT.

d. Cockpit hood—OPEN and STOPPED.

e. Wing flaps—"DOWN". If time permits:

f. Ignition switch—"OFF".

g. Battery switch—"OFF".

h. Mixture control—"IDLE CUT-OFF".

i. Fuel selector valve—"OFF"

j. Landing gear "UP"—if landing on soft or rough terrain.

4-7. ON WATER. The emergency procedure for landing on water is essentially the same as that for on land except that landing gear MUST be "UP"

a. Cockpit hood—OPEN and STOPPED.

b. Smooth sea—land into the wind.

c. Rough sea—land along trough of swell—across wind if necessary.

d. Make a power stall landing with the flaps full "DOWN".

4-8. EMERGENCY ESCAPE FROM AIRPLANE.

4-9. The cockpit hood is equipped with quick release latches, consisting of release pins with red finger rings attached, one on each side of the forward end of the track. To jettison the hood in flight:

a. Open hood one inch.

b. Turn red finger rings INBOARD and pull both lockpins AFT simultaneously.

c. Push forward end of hood UP into airstream and lower head to prevent injury in case hood does not clear properly.

4-10. The right and left hand side panels of the hood can be opened for emergency exit when the airplane is in an inverted position on the ground by means of the release lever (painted red) located on the center strip of the panel.

a. Pull release lever INBOARD and UP.

b. Push panel OUTBOARD.

4-11. EMERGENCY OPERATION OF ELECTRICAL SYSTEM.

4-12. HIGH VOLTAGE (over 30.0 volts). If the voltmeter reading is over 30.0 volts, turn "OFF" all switches for circuits not essential to flight. Turn "OFF" battery switch in order to prevent overcharging. Recharge the battery periodically by closing the battery switch for not more than five minutes at a time.

4-13. LOW VOLTAGE (below 26.0 volts). If the voltmeter reading is below 26.0 volts, immediately turn off all equipment requiring heavy electrical loads. Then turn the battery switch "OFF" to determine if the generator system is operating properly. If light electrical loads such as cockpit lights and instruments continue to operate, the reverse current cut-out has not opened and the generator is still supplying current to the battery. If the lights and instruments cease to operate it is an indication that the reverse current cut-out has opened and that the battery is the only source of electric power. In that case, conserve the battery by using electrically operated equipment as sparingly as possible.

4-14. ELECTRICAL FIRE. If the faulty circuit is known, turn off the proper switch. Otherwise, turn "OFF" the battery switch and all other electrical switches. Turn the electrical switches back on one at

a time until the faulty circuit can be determined by a new outbreak of fire. Do not use the faulty circuit.

4-15. EMERGENCY OPERATION OF HYDRAULIC SYSTEM.

4-16. GENERAL. If there is insufficient hydraulic pressure to operate any of the various systems due to a line failure or malfunctioning of the engine-driven pump, the hydraulic hand pump should be used to supply pressure to the desired system.

4-17 LANDING GEAR. To operate the landing gear by means of the hydraulic hand pump, proceed as follows:

a. Move landing gear control "UP" or "DOWN" as desired.

b. Move hand pump selector valve control, located on the right hand cockpit shelf to "LANDING GEAR ONLY"

c. Operate hand pump through approx. 90 cycles (double strokes) to RAISE WHEELS and approx. 70 cycles (double strokes) to LOWER WHEELS.

Note

The landing gear will not LOCK DOWN above 135 knots IAS. When lowering by hand pump, considerably less effort will be required if the airspeed is reduced to 100 knots or less.

4-18. WING FLAPS. To operate the wing flaps by means of the hydraulic hand pump, proceed as follows:

a. Turn wing flap switch to "UP" or "DOWN" as desired.

b. Move hand pump selector valve to "FLAPS ONLY".

c. Operate hand pump through approx. 35 cycles (double strokes) to LOWER FLAPS, and approx. 25 cycles (double strokes) to RAISE FLAPS.

Note

The wing flaps are held down only by hydraulic pressure remaining constant—there is no other lock. In an emergency when loss of pressure is indicated in the hydraulic system, always lower the landing gear before the flaps. If the flaps are lowered first, the force of the airstream may overcome the hydraulic pressure (reduced by leaks) and force the flaps up, in which case there may not be sufficient pressure to lower them again.

4-19. GUN CHARGING. Refer to Section V.

4-20. COWL FLAPS. To operate the cowl flaps by means of the hydraulic hand pump, proceed as follows:

a. Cowl flaps control lever—"OPEN" or "CLOSED" as required.

b. Hand pump selector valve control—"ENGINE FLAP".

c. Operate hand pump.

4-21. WING LOCK. To operate the wing lock mechanism by means of the hydraulic hand pump proceed as follows:

a. Wing lock control lever—"LOCK" or "UNLOCK" as required.

b. Hand pump selector valve—"WING LOCK".

c. Operate hand pump.

Note

When using the hydraulic hand pump to unlock the wing locking pins, place hand pump selector valve on "SYSTEM" and pump until system gage indicates 1500 psi BEFORE pushing wings up to SPREAD position. This operation will charge the hydraulic accumulator which has sufficient capacity to engage the main locking pins the instant the wing reaches the SPREAD position. After pins are engaged, pump a few extra strokes to make certain pins are FULL HOME.

4-22. OIL COOLER SHUTTER. To operate the oil cooler shutter by means of the hydraulic hand pump, proceed as follows:

a. Oil cooler shutter control lever—"OPEN" or "CLOSED" as required.

b. Hand pump selector valve control—"SYSTEM".

c. Operate hand pump.

4-23. INTERCOOLER SHUTTERS. To operate the intercooler shutters by means of the hydraulic hand pump, proceed as follows:

a. Intercooler shutters control lever—"OPEN" or "CLOSED" as required.

b. Hand pump selector valve—"SYSTEM".

c. Operate hand pump.

4-24. EMERGENCY LANDING GEAR OPERATION.

4-25. GENERAL. If the landing gear fails to come down when the hydraulic control lever is operated (using either engine-driven or hand pump hydraulic pressure), the gear may be lowered and locked by means of the air bottle emergency system. The system is controlled by the emergency release "T" handle located on the lower center control panel.

Note

Do not use emergency landing gear release above 90 knots IAS.

4-26. TO LOWER LANDING GEAR. Pull "T" handle FULL DOWN and LOCK. Check landing gear indicator to make certain wheels are DOWN and LOCKED. Time required to LOWER wheels is approximately ten seconds.

4-27. When the "T" handle is pulled, the uplocks are released, the air system vent valve closes, the air bottle

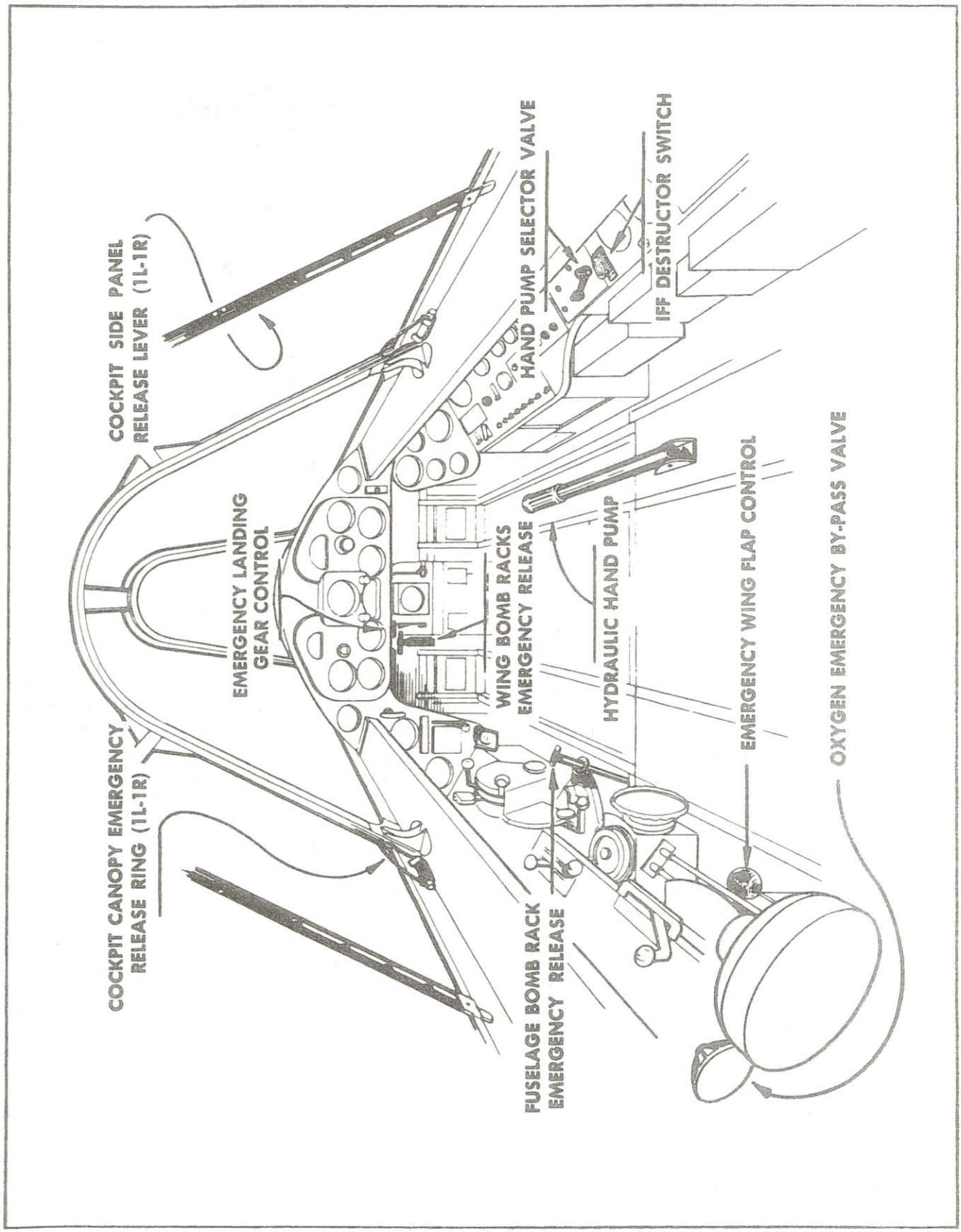


Figure 4-1. Emergency Controls Diagram

valve opens, and the ON-OFF hydraulic dump valve opens, all functioning simultaneously. This system will operate regardless of the position of the square knob control lever. No other part of the hydraulic system is affected by the use of this control. Normal operation of the landing gear hydraulic system is restored when the "T" handle is returned to its normal position. This should not be done until after landing and the reason for hydraulic failure has been determined.

CAUTION

The wheels cannot be lowered more than once by this control; therefore, do not operate it until it is certain that the hand pump system will not function. If the emergency system is operated at higher airspeeds than it can overcome, the gear will come down only part way and trail. Any small leak in the system might therefore dissipate enough of the limited supply of air with the result that gear will not extend completely. Fly as slowly as possible before operating this control and hold this slow speed until the gear is DOWN and LOCKED.

4-28. If it is desired to make a wheels-up landing after the landing gear has been lowered by the emergency control, the wheels may be retracted by raising the emergency "T" handle control back to its normal position, the square knob control lever to wheels "UP" position, hand pump selector valve to "LANDING GEAR" and operating the hand pump.

4-29. The landing gear emergency air bottle pressure should be checked before each flight. To read pressure on the gage, located on the right hand cockpit shelf, turn the air bottle valve to OPEN position just long enough to read pressure, then close. Only a slight hand pressure is necessary to close the valve. The air bottle pressure should be 1850 ±50 psi.

4-30. EMERGENCY WING FLAP OPERATION.

4-31. ELECTRIC POWER FAILURE. In the event of an electric power failure, the wing flaps may be lowered or raised by operating the spring-loaded manual control lever located on the lower left hand side of the cockpit, as follows:

a. Push manual lever DOWN and then move FORWARD for "FLAPS UP".

b. Push manual lever DOWN and then move AFT for "FLAPS DOWN".

c. Move lever to CENTER for NEUTRAL.

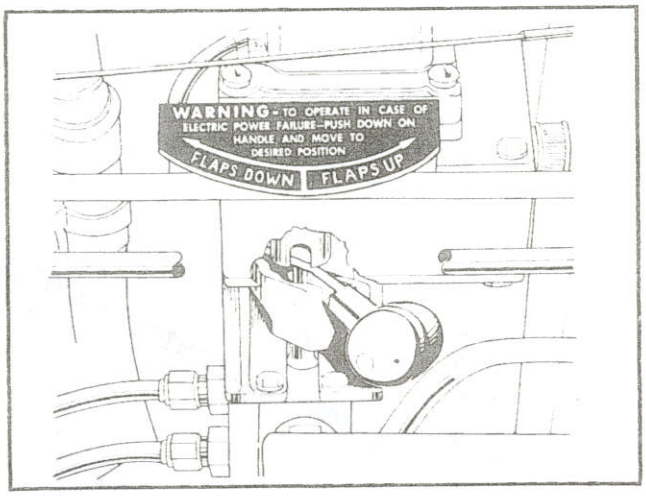


Figure 4-2. Emergency Wing Flap Control

Note

It is important to push red handled lever DOWN to disconnect electric motor before moving it FORWARD or AFT. If the lever is forced to either position without first pushing it DOWN, serious damage will be done to the electric motor splined shaft and to the rubber clutch. If electric power is restored after manual wing flap control lever has been operated, move lever to NEUTRAL position.

4-32. HYDRAULIC FAILURE. If the engine-driven hydraulic pump is not operating or the system is in some other way damaged, the wing flaps can be raised or lowered by operating the hydraulic hand pump with the hand pump selector valve as follows:

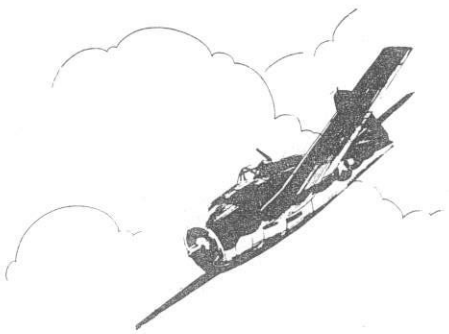
a. Move electric wing flap switch to "UP" or "DOWN" position as required; or if the electric power has also failed, move the wing flap manual control lever to "FLAPS UP' or "FLAPS DOWN" as required.

b. Move hand pump selector valve control to "WING FLAPS" position.

c. Operate hydraulic hand pump through approx. 35 cycles (double strokes) to LOWER flaps, and approx. 25 cycles (double strokes) to RAISE flaps.

4-33. EMERGENCY ARRESTING HOOK OPERATION.

4-34. The arresting hook emergency "T" handle control is located on the bulkhead aft of the pilot's seat on the lower left hand side. This control will lower the hook; it will not retract it. To lower the hook in the event of failure of the electrical mechanism, pull "T" handle and release. Repeat approximately five strokes. When the arresting hook is fully extended, the pilot will be unable to pull the handle through a full stroke.



SECTION V
OPERATING EQUIPMENT

5-1. ARMAMENT

5-2. WING GUNS. The F6F-3 and -3N airplanes are equipped with six .50 cal machine guns installed in the outer panels, three left and three right, with a maximum of 2400 rounds of ammunition.

5-3. The F6F-5 and -5N airplanes are designed to accomodate either six .50 cal machine guns or a mixed battery in which a 20 mm cannon replaces the inboard .50 cal machine gun, one left and one right. All late model F6F-5N airplanes are provided with mixed batteries. Three ammunition boxes, for each gun, are installed outboard of the guns through hinged, folding doors in the wing upper surface.

Note

Airplanes equipped with mixed batteries will carry a maximum of 1800 rounds of .50 cal ammunition and 250 rounds of 20 mm ammunition.

5-4. The guns are charged hydraulically by the two control handles located on the lower center control panel and fired electrically by a switch installed on the control stick grip. The armament master switch and the gun selector switches are located on the armament control panel on the right hand side of the cockpit. Provision is made for the installation of gun heaters.

Note

The gun heater circuit, connected directly to the generator through circuit breakers, will be energized only when the generator is operating. The battery will not energize the gun heaters. If it is desired to prevent the heaters from operating when the engine is running, the plug at the heater must be disconnected.

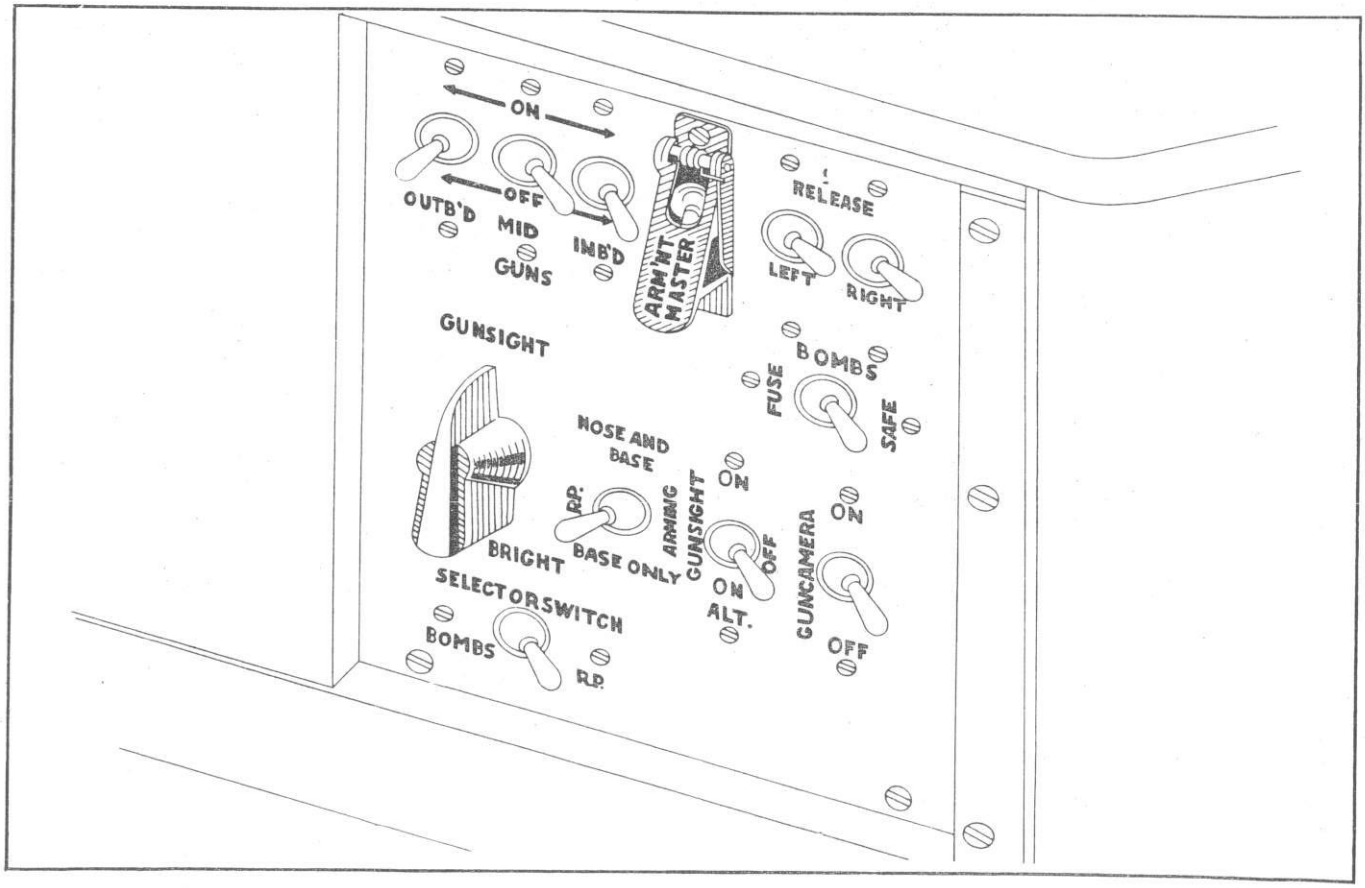


Figure 5-1. Armament Control Panel

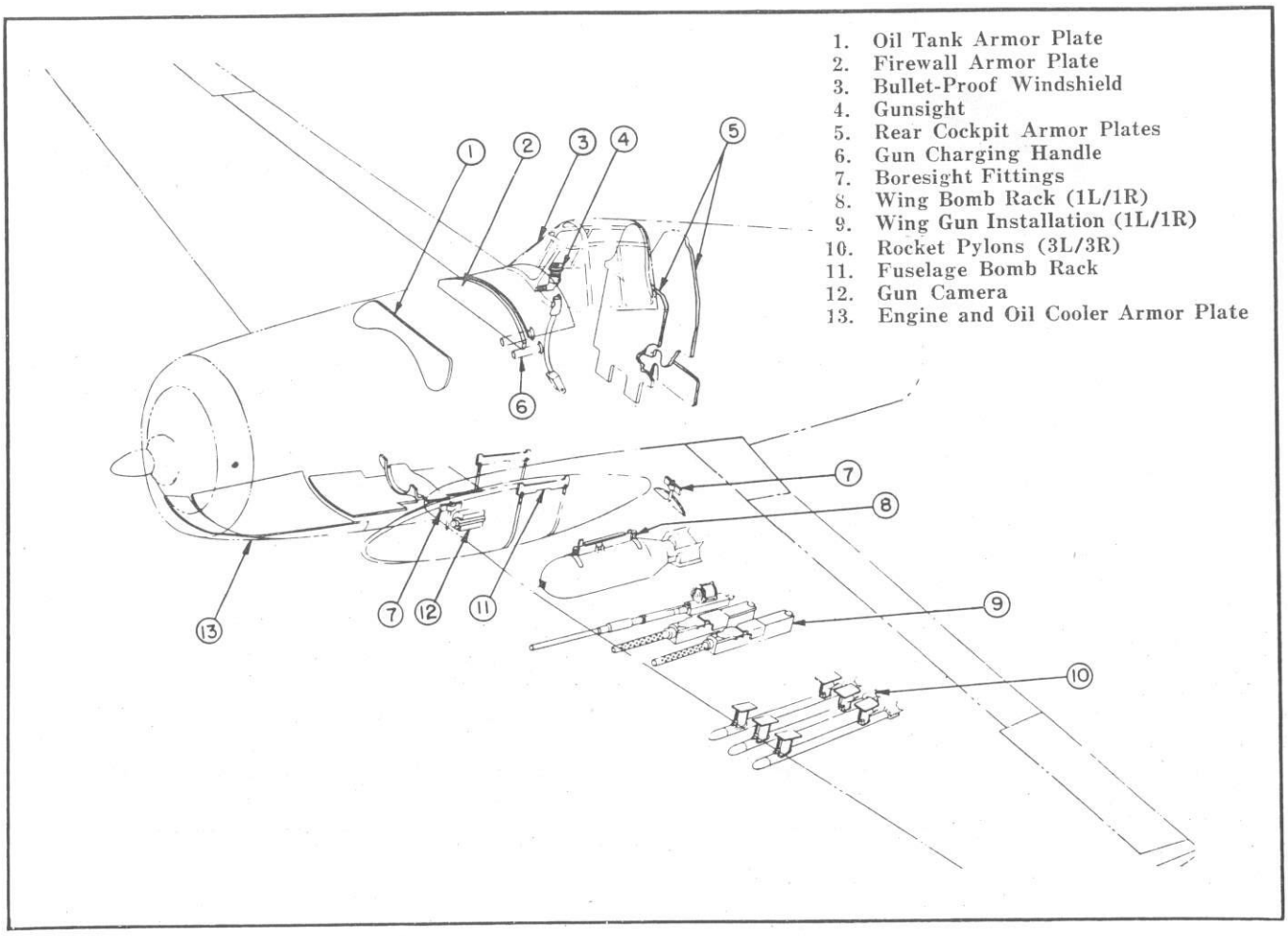


Figure 5-2. Armament Installation

5-5. The guns are set so that their cone of fire will converge at 300 yards. The gun sight line is parallel to the fuselage datum line and the guns fire up to converge with the line of sight at 300 yards.

5-6. TO CHARGE GUNS. To charge the wing guns, proceed as follows:

a. Turn gun charger handles clockwise to "CHARGE".

b. Push handles FULL IN. Handles will automatically spring OUT when guns are charged.

c. Turn handles COUNTERCLOCKWISE to "SAFETY" position.

5-7. TO SAFETY GUNS. To safety the wing guns, proceed as follows:

a. Turn gun charger handle COUNTERCLOCKWISE to "SAFETY" position.

b. Push handle FULL IN. (Handle will remain IN until turned to "CHARGE" position.)

5-8. AUXILIARY CHARGING OPERATION. If the engine-driven hydraulic pump is not operating, the guns may be charged by setting the hand pump selector valve control at "GUN CHARGING" and operating the hand pump while operating the gun charging control handles as described above. Approximately 800 psi hydraulic pressure is required.

5-9. TO FIRE GUNS. To fire wing guns after charging, proceed as follows:

a. Turn gun selector switch (or switches) to "ON" position.

b. Turn armament master switch to "ON" position.

Note

The F6F-3 and -3N airplane has two gun selector switches; one switch controls the outboard and mid guns and the other switch controls the inboard gun. The F6F-5 and -5N is provided with three gun selector switches; one for each pair of guns.

c. Press trigger switch on control stick grip.

5-10. GUNSIGHT.

5-11. GENERAL. A Mark 8 gunsight is mounted on the airplane centerline just aft of the windshield. A two filament lamp within the gunsight illuminates and projects the deflection rings and cross hairs on the bullet-resistant glass of the windshield. A spare lamp is clipped to the gunsight mount and may be installed in flight.

5-12. OPERATION. The two filament lamp is controlled by a switch which may be placed in "ON" or "ALTERNATE" positions enabling the pilot to switch to the second filament if one burns out in flight. The intensity of the lamp is controlled by a rheostat. Both switch and rheostat are located on the armament panel.

5-13. BOMBING EQUIPMENT.

5-14. GENERAL. A MK 51-7 bomb rack is installed on each side of the wing center section. A 1000 lb bomb can be carried on each wing rack. Shackle selector, bomb selector and arming switches are located on the armament control panel. The bombs release switch button is installed on the top of the control stick grip.

5-15. Late model airplanes are equipped with emergency manual release handles for wing bombs. The control handles are located at the upper left hand side of the lower center control panel.

5-16. TO RELEASE BOMBS. To release bombs from wing bomb rack, proceed as follows:

a. BOMBS—RP selector switch—"BOMBS".

b. Switch for bomb or bombs to be released—"ON".

c. Fusing switch—"FUSE".

d. Armament master switch—"ON".

e. Press bomb release button on control stick grip.

f. For emergency release, pull AFT on manual release handle.

5-17. ROCKETS.

5-18. GENERAL. Late model airplanes are equipped with six MK V rocket launchers installed on the underside of the wing outer panel, three left and three right. The rockets are controlled by the selector switch on the armament control panel and a station distributor installed on the lower center control panel.

5-19. OPERATION — MK 1 STATION DISTRIBUTOR. Airplanes Bu. No. 94449 and subsequent, are equipped with MK 1 station distributors; to fire rockets proceed as follows:

a. BOMBS RP selector switch—"RP".

b. Rockets are set for impact burst by moving RP arming switch, located on armament control panel, to "BASE and NOSE", and for delayed burst by moving arming switch to "BASE ONLY".

c. The number of rockets to be fired and the sequence is controlled by the MK 1 station distributor, located on the lower center control panel. To fire rockets in pairs, from outboard to inboard, rotate distributor handle counterclockwise to "2-2-2". To fire the outboard rockets in pairs and then the mid and inboard rockets together, rotate distributor handle to "2-4".

d. Armament master switch—"ON".

e. Depress bomb release button on control stick grip.

WARNING

Do NOT push SALVO PRESET as the instantaneous firing of all rockets places an excessive strain on wings. When this unit is altered so that a ripple salvo can be fired, instructions will be issued.

5-20. OPERATION—MK 3 STATION DISTRIBUTOR. Airplanes up to and including Bu. No. 94448 are equipped with MK 3 station distributors. To fire rockets, proceed as follows:

a. BOMBS—RP selector switch—"RP".

b. Station distributor ON-OFF switch—"ON".

c. Arming switch—"ARM".

d. To fire all rockets in SALVO, set SINGLE-AUTO switch to "AUTO". To fire rockets in pairs, set SINGLE-AUTO switch to "SINGLE" and rotate a selector knob to desired position—"1" is outboard pair, "2" is mid pair, and "3" is inboard pair.

e. Armament master switch—"ON".

f. Depress bomb release button on control stick grip.

5-21. GUN CAMERA. An AN-N4 gun camera is installed in the leading edge of the left wing inboard the guns. The gun camera control switch is located on the armament control panel. To operate gun camera, proceed as follows:

a. Gun camera switch—"ON".

b. Armament master switch—"ON".

c. Depress either bomb release button or gun trigger on stick grip.

5-22. OXYGEN SYSTEM.

5-23. CYLINDER AND CONTROL. A standard 514 cu in. capacity shatter-proof cylinder is installed in the fuselage aft of cockpit rear bulkhead. Normal cylinder pressure is 1800 psi. The shut-off valve handwheel, connected to the cylinder, projects through cockpit rear bulkhead to the left of the pilot's seat. Turn handwheel COUNTERCLOCKWISE to "OPEN".

5-24. REGULATOR. A diluter-demand type regulator, together with a cylinder pressure gage is mounted to the left of the pilot's seat adjacent to the cylinder shut-off valve handwheel. An oxygen flow indicator is installed just below the landing gear control.

5-25. The diluter-demand regulator is designed to meet the demands of the inhalation phase of the breathing cycle and deliver either a properly proportioned mixture of air and oxygen or 100% oxygen dependent upon the setting of the adjustable air-valve lever. With the air-valve set to the "ON" (normal oxygen) position, air is drawn into the breathing system and is automatically mixed with oxygen from the supply cylinder to give the total needed oxygen required up

to approximately 30,000 ft beyond, which 100% cylinder oxygen is delivered. With the air-valve set to the "OFF" (100% oxygen) position, 100% oxygen is delivered at all altitudes. With the air-valve of the diluter-demand regulator set to the "ON" (normal oxygen) position, a relatively small inhalation suction (one inch of water suction) is sufficient to deliver a flow of 150 liters of oxygen per minute. This characteristic assures the user an adequate oxygen flow and ease of breathing.

5-26. The regulator is attached directly to the high pressure oxygen supply through $\frac{3}{16}$ inch OD copper tubing connected to the cylinder; the pressure in the cylinder may decrease from 1800 or 2000 psi to 50 psi without effecting the normal operation of the regulator.

5-27. PREFLIGHT CHECK LIST. The following items should be checked while the plane is on the ground prior to flight in which oxygen is to be used, or is likely to be used, to assure proper functioning of the oxygen system:

a. Emergency valve—"CLOSED".

b. Open cylinder valve and allow at least ten seconds for pressure in line to equalize. Pressure gage should read 1800 ±50 psi, if the cylinder is fully charged.

c. Close cylinder valve. After a few minutes, observe pressure gage and simultaneously open cylinder valve. If gage pointer jumps—leakage is indicated.

d. If leakage was found by paragraph (3) above—test further. Open cylinder valve, carefully noting pressure gage reading—then close cylinder valve. If gage pointer drops more than 100 psi in five minutes there is excessive leakage, and such an oxygen system must be repaired prior to use.

e. Check mask fit by placing thumb over end of mask tube and inhale lightly. If there is no leakage, mask will adhere tightly to face due to suction created. If mask leaks—tighten mask suspension straps and/or adjust nose wire.

CAUTION

DO NOT USE A MASK THAT LEAKS.

f. Couple mask securely to breathing tube by means of quick disconnect coupling. IMPORTANT: Mating parts of coupling must be fully engaged, not "COCKED".

g. Open cylinder valve. Depress diaphragm knob through hole in center of regulator case, and feel flow of oxygen into the mask—then release diaphragm knob. Breathe several times observing oxygen flow indicator (if installed) for "blink" verifying the positive flow of oxygen.

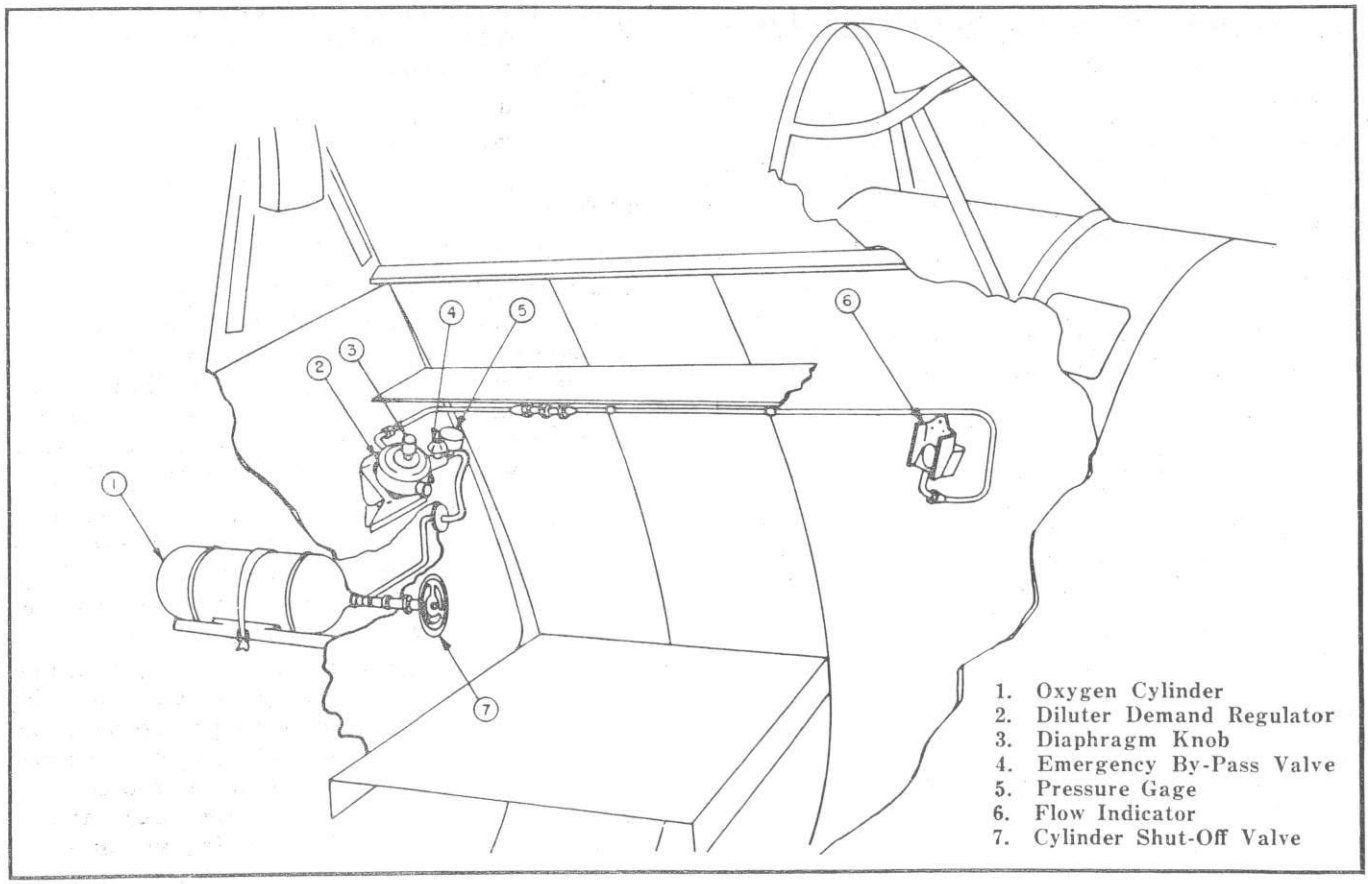


Figure 5-3. Oxygen System Installation

Note

Since the amount of added oxygen is very small at sea level, the oxygen flow meter may not operate while plane is on the ground. In this case turn air-valve to "OFF" (100% oxygen) and test again. If oxygen flow indicator operation is now satisfactory, reset air-valve to "ON" in which setting adequate oxygen flow and "blinker" operation will be assured at oxygen-use altitudes.

h. Check emergency valve by turning counterclockwise slowly until oxygen flows vigorously into mask—then close emergency valve.

i. Upon completion of oxygen flight—close cylinder valve.

5-28. OPERATING INSTRUCTIONS.

a. Open oxygen cylinder valve. Pressure gage should read 1800 ±50 psi, if cylinder is fully charged.

b. Set air-valve to "ON" (normal oxygen) position—except when the presence of excessive carbon monoxide is suspected—then set to "OFF" position.

c. Put on oxygen mask. Be sure that quick disconnect coupling is fully engaged.

d. Check mask fit by squeezing mask tube and inhaling lightly. Mask will adhere tightly to face due to suction, if there is no leakage. If mask leaks, tighten mask suspension straps.

CAUTION

Never check mask fit by squeezing mask tube while emergency valve is ON.

e. Breathe normally and observe oxygen flow indicator (if installed) for "blink", verifying positive flow of oxygen.

f. Frequently check cylinder pressure gage for state of available oxygen supply, and oxygen flow indicator for flow of oxygen to mask.

g. Upon completion of oxygen flight—close cylinder valve by rotating handle CLOCKWISE.

CAUTION

Keep oxygen equipment free from oil, grease and easily oxidized materials.

5-29. COMMUNICATING EQUIPMENT.

WARNING

The operation of this communication equipment involves the use of high voltages which are dangerous to life. Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside the equipment with the high voltage supply turned on. Always shut down dynamotors or other associated power equipment, and open the main switch in the power supply circuit. Under certain conditions dangerous potentials may exist in circuits with the power controls in the off position due to charges retained by the capacitors. To avoid casualties, always discharge and ground the circuits prior to touching them. To avoid the possibility of fire, no installed radio transmitter should be tested or operated in any way with the dynamotor running until all parts of the antenna system are at least one foot removed from any object other than the airplane itself.

5-30. GENERAL. The communication system is divided into four groups: radio equipment, IFF equipment, radio altimeter and radar equipment. Radio altimeters and radar equipment are installed only in NIGHT FIGHTER airplanes F6F-3N and F6F-5N. The installation of the units follows conventional practice with control units within easy reach of the pilot on the right hand side of the cockpit, and in general, all transmitters and receivers located in the fuselage behind the cockpit.

5-31. RADIO EQUIPMENT.

Note

Per Service Change No. 82 now in effect, all radio equipment in F6F-3, -3N, -5, and -5N will include only AN/ARC-5, AN/ARC-1 and AN/ARR-2 equipment.

5-32. The AN/ARC-5 hf and AN/ARC-1 vhf radio equipment is used primarily for airplane-to-airplane or airplane-to-carrier communication. The AN/ARC-5 equipment consists of an mf transmitter and a range receiver. The AN/ARC-1 equipment consists of a 10 channel transmitter-receiver. The AN/ARR-2 receiver and the lf radio range receiver are used for navigation. Three of the following receivers (hf and lf) may be installed, depending upon the mission of the airplane: hf communication receiver, navigation receiver, and radio range receiver. The radio range receiver and its associated control are used primarily for ferrying purposes.

5-33. The following radio controls are installed in the cockpit (see figure 5-4):

a. RADIO MASTER SWITCH. Located on top of electrical control panel.

b. MASK MICROPHONE "PRESS-TO-TALK" SWITCH. Located on throttle handle.

c. HAND MICROPHONE "PRESS-TO-TALK" SWITCH. Located on hand microphone which is stowed on right hand cockpit shelf.

d. C-38/ARC-5 RECEIVER CONTROL UNIT. Located on right hand side of cockpit.

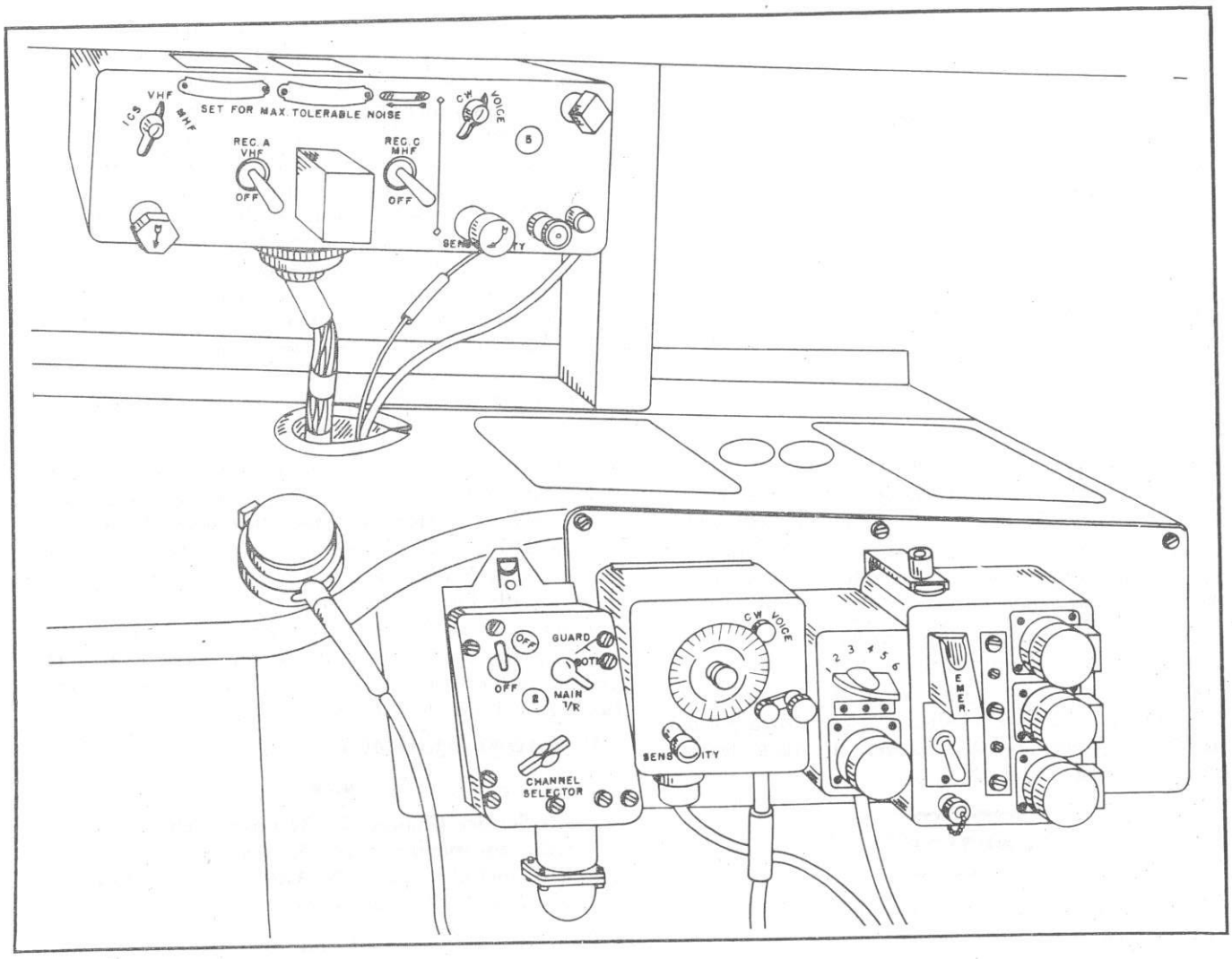


Figure 5-4. Radio Controls

e. C-26/ARC-5 RADIO RANGE CONTROL. Located on right hand side of cockpit.

f. C-45/ARC-1 TRANSMITTER CONTROL. Located on right hand side of cockpit.

5-34. OPERATION OF RADIO EQUIPMENT.

5-35. With the battery switch in the "ON" position, the engine running and the generator charging, turn ON the radio master switch located on the MASTER control unit. Set volume control to maximum and plug the headset into the pilot's jack box located on the side of the right hand panel. Plug either the hand or mask microphone into the jack box.

5-36. TRANSMISSION.

a. The position of the microphone selector on the receiver control unit (C-38/ARC-5) determines which component is used for transmission. The stop on the selector switch is arranged to permit turning to vhf and mhf only.

b. On the receiver control unit (C-38/ARC-5), throw toggle switch REC. C (mhf) to "OFF", and turn the navigation SENSITIVITY control to minimum; on the radio range control unit (C-26/ARC-5) turn SENSITIVITY to minimum.

c. For mhf, set microphone selector switch to "MHF", press microphone switch and talk.

d. For vhf, set microphone selector switch to 'VHF", set rotary switches on the transmitter control unit (C-45/ARC-1) as desired. Press microphone switch and talk.

e. The transmitter control unit (C-45/ARC-1) control switches are operated as follows: for transmission and reception any one of nine main channels use position "MAIN T/R"; for transmission and reception on any main channel and simultaneous reception on the GUARD channel use position "BOTH", for transmission and reception on the GUARD channel use position "GUARD".

5-37. RECEPTION.

a. For vhf, turn toggle switch REC. A on the receiver control unit (C-38/ARC-5) to the "UP" position and operate the transmitter control unit (C-45/ARC-1) as described under transmission.

Note

When the airplane is in a location relatively free from electrical noise and the engine is not running, no noise should be heard from the vhf receiver unless a signal is present. A noticeable hiss would indicate that the sensitivity is set too high. When the engine is running, a strong smooth hiss would indicate that the sensitivity is set too high. If ignition noise is present, it is an indication that the engine is producing excessive noise or the sensitivity is set too high. (See Navy Engine Bulletin No. 113 and model AN/ARC-1 Maintenance Instructions AN-8-30 ARC 1-3.

b. For mhf, turn toggle switch REC. C on the receiver control unit (C-38/ARC-5) to the "UP" position. Set for maximum tolerable noise. (This should be done with receiver A (vhf) OFF and navigation **SENSITIVITY** at a minimum. Both of these may be turned on again after the maximum tolerable noise is adjusted.)

c. For simultaneous reception on vhf & mhf, turn switches REC. A and REC. C to the "UP" position.

5-38. TO RECEIVE NAVIGATION SIGNALS.

a. On the receiver control unit (C-38/ARC-5) control turn switches REC. A and REC. C to the "OFF" position.

b. Operate the crank unit until the assigned channel number appears in the window.

c. Set NAV-VOICE selector switch to NAV. Set the OUTPUT control to produce a usably weak signal, or if the desired signal cannot be heard, to a fairly strong background hiss. VOLUME control should be left at maximum when using the AN/ARR-2 receiver.

d. Adjust the BEAT-NOTE control to produce a pleasing audible tone.

e. Readjust **SENSITIVITY** control to produce a usably weak signal. (If the signal is too strong, a clear-cut indication cannot be obtained.)

f. Turn the **SENSITIVITY** to a minimum.

5-39. TO RECEIVE RANGE SIGNALS.

Note

The following applies if a range receiver rather than a lock-tuned hf receiver is installed.

a On the range receiver control unit (C-26/ARC-5), make sure the rotary switch is set on "VOICE".

b. Advance the SENSITIVITY control until normal background noise is heard.

c. Tune in the desired radio range station and readjust the SENSITIVITY control for normal operation.

d. Rotate the SENSITIVITY control counterclockwise to a minimum.

5-40. RADIO CHECK-OFF LIST. Perform the following operations.

5-41. BEFORE TAKE-OFF.

a. Plug in headset and microphone.

b. Battery switch—"ON".

c. Radio master switch—"ON".

d. Test vhf receiver.

e. Perform operations applicable to the mission of the airplane—test navigation receiver—test range receiver.

f. Set controls for simultaneous reception of communication and navigation receivers.

g. Select desired transmission channel, and if activity instructions permit, make test transmission with base station.

5-42. AFTER LANDING.

a. Radio master switch—"OFF".

b. Range receiver controls—"OFF".

c. Battery switch—"OFF".

5-43. OPERATING NOTES AND PRECAUTIONS. Observe the following operating notes and precautions:

a. Observe radio silence regulations.

b. Reliable operation of vhf equipment is generally confined to approximately line-of-sight distance as determined by the height of the transmitting and receiving antennae, but since transmission at these frequencies is affected by meteorological conditions, large deviations from the line-of-sight distance may occur in certain areas.

5-44. IFF EQUIPMENT.

5-45. AN/APX-1 equipment consisting of a transmitter-receiver unit, a pilot's control unit located on the right hand side of the cockpit, and an impact switch is installed in all F6F-5 and late model F6F-3 airplanes. AN/APX-2 equipment is installed in all night fighter airplanes—F6F-5N and F6F-3N.

5-46. RADIO ALTIMETER (NIGHT FIGHTER ONLY).

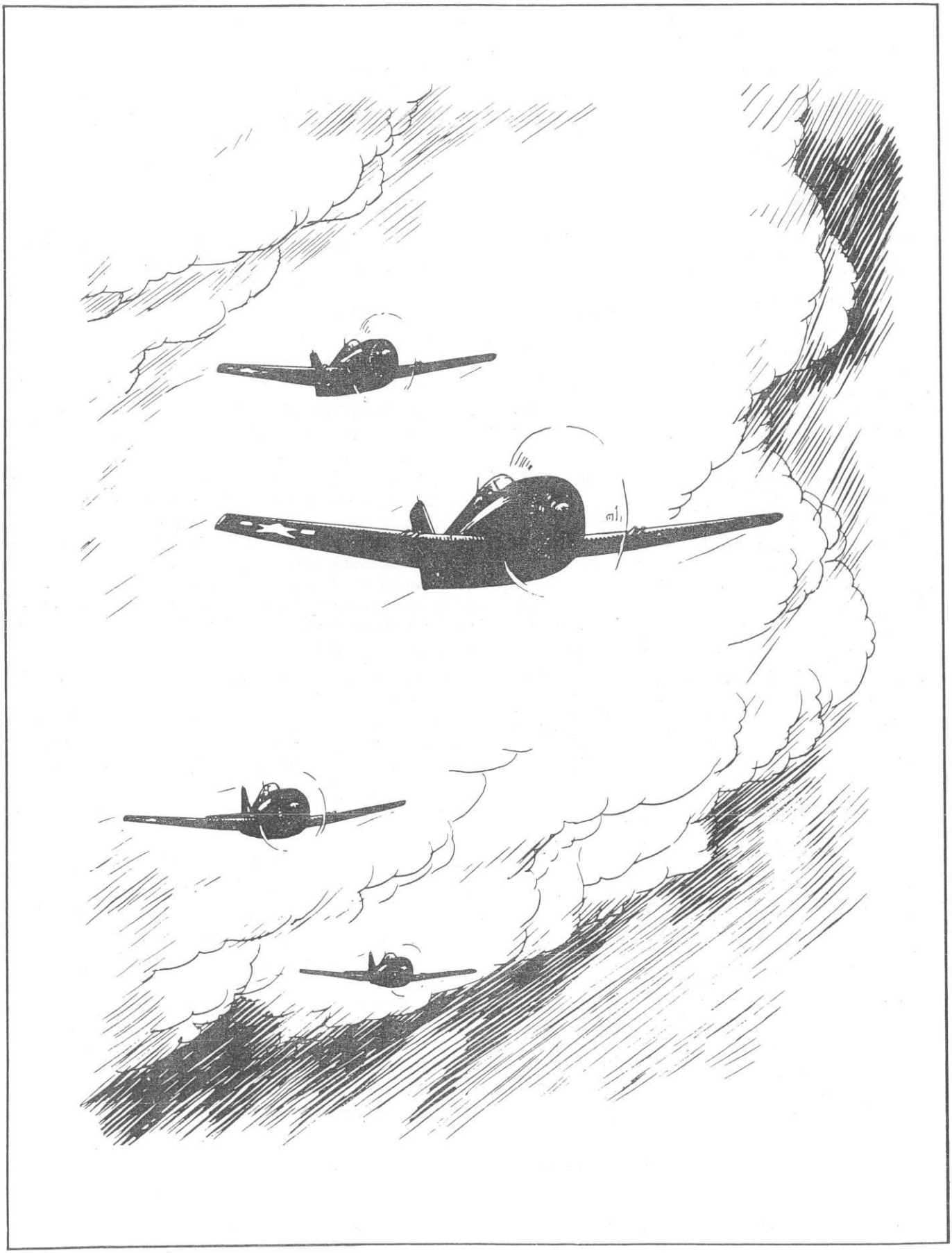
5-47. An AN/APN-1 altimeter is installed in F6F-5N and F6F-3N airplanes. The altitude limit switch is located just to the left of the pilot's seat. The indicator is installed on the left side of the main instrument panel; and the lights, at the base of the panel.

5-48. RADAR EQUIPMENT (NIGHT FIGHTER ONLY).

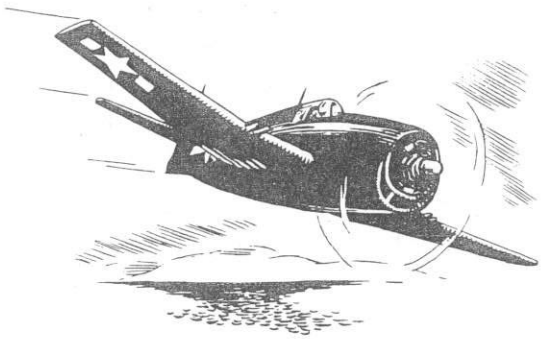
5-49. AN/APS-4 radar equipment is installed in all F6F-3N night fighter airplanes. AIA radar equipment is installed in early F6F-5N night fighter airplanes (BuAer No. 58004-No. 58989), and late model F6F-5N airplanes (BuAer No. 70038 and subsequent) are equipped with AN/APS-6A or AN/APS-6 radar equipment.

Note

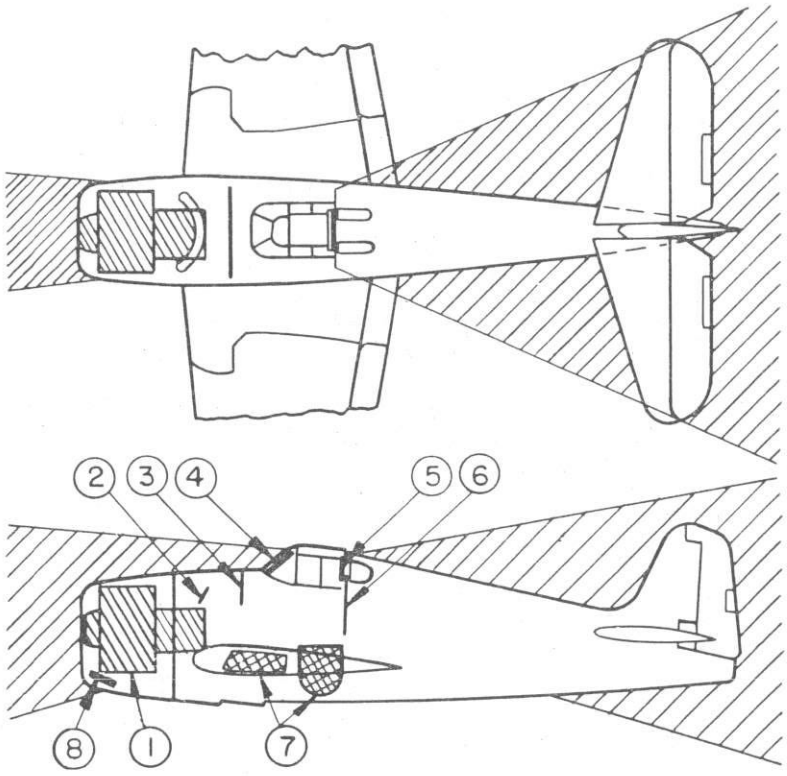
For information on the operation of APX, APN, AIA and APS equipment, refer to applicable T.O.'s.



Appendix I of this publication shall not be carried in aircraft on combat missions or when there is a reasonable chance of its falling into the hands of the enemy.



APPENDIX



1. Engine
2. Homogeneous Armor Plate—Oil Tank
3. Homogeneous Armor Plate
4. Bullet Resistant Glass
5. Face Hardened Armor Plate—Head
6. Homogeneous Armor Plate
7. Fuel Tanks—Secondary Protection
8. Homogeneous Armor Plate Oil Cooler

Figure A-1. Protection from Gunfire Diagram

Appendix I of this publication shall not be carried in aircraft on combat missions or when there is a reasonable chance of its falling into the hands of the enemy.

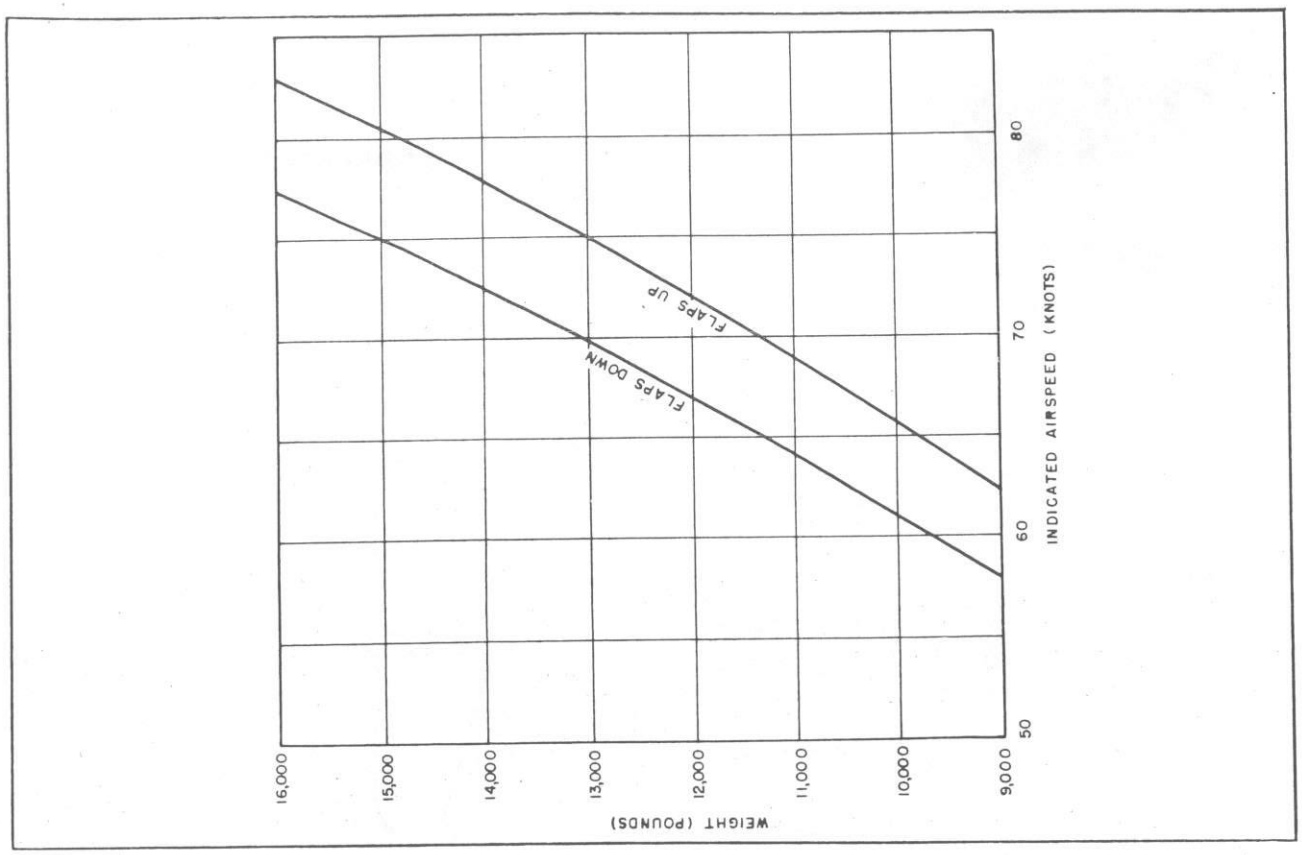


Figure A-3. Stalling Speed (Power Off)

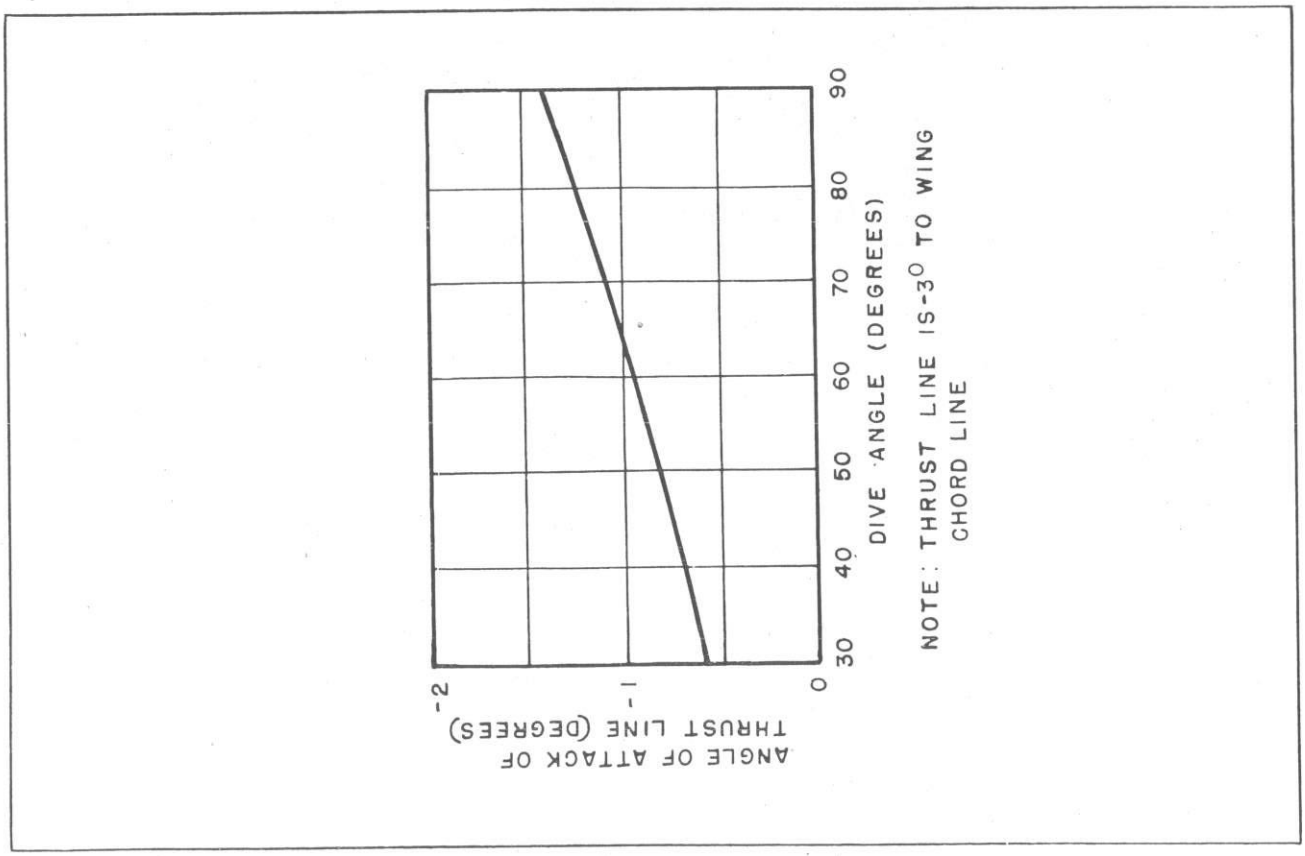


Figure A-2. Dive Angle vs. Angle of Attack of Thrust Line

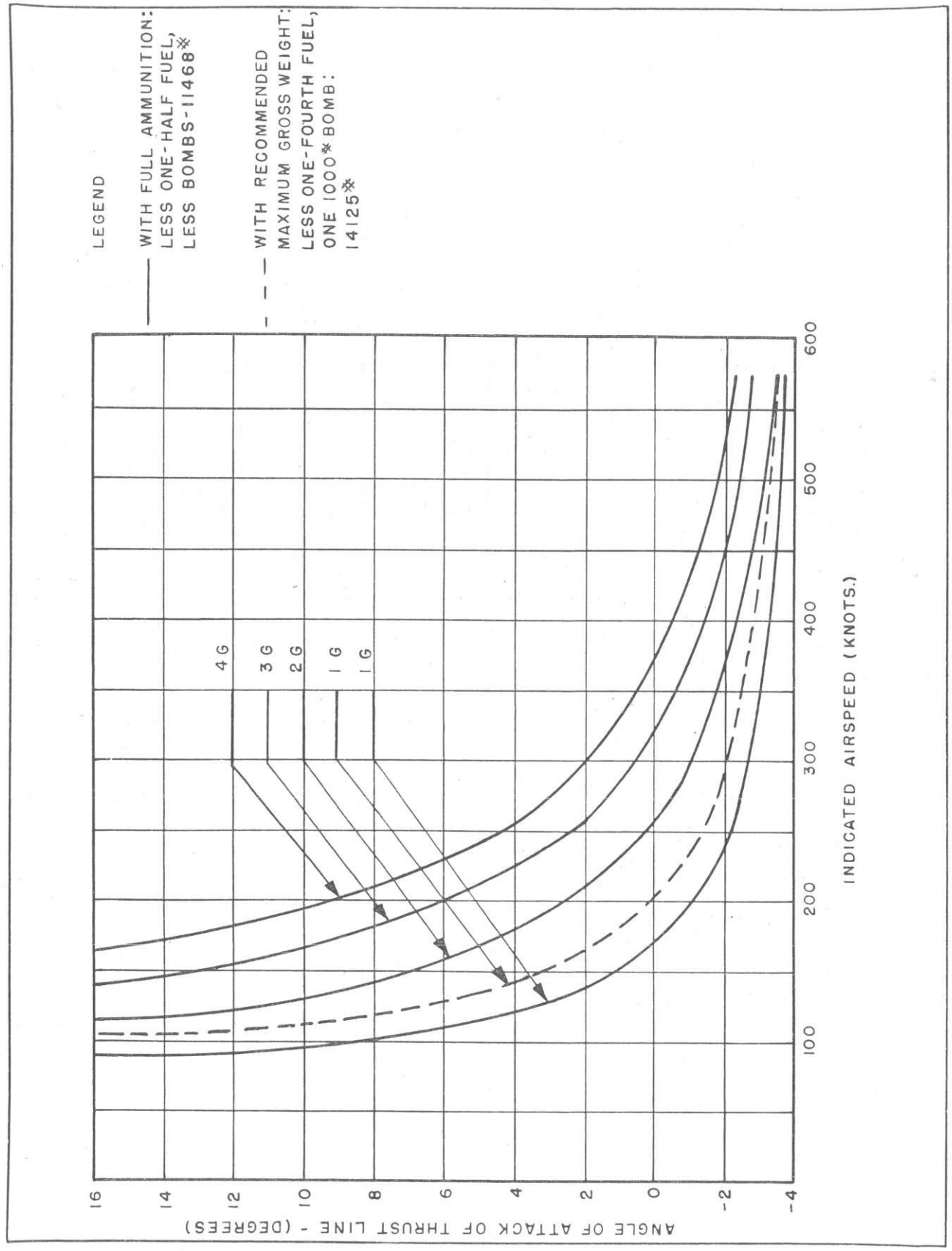


Figure A-4. Angle of Attack vs. Indicated Airspeed Curves

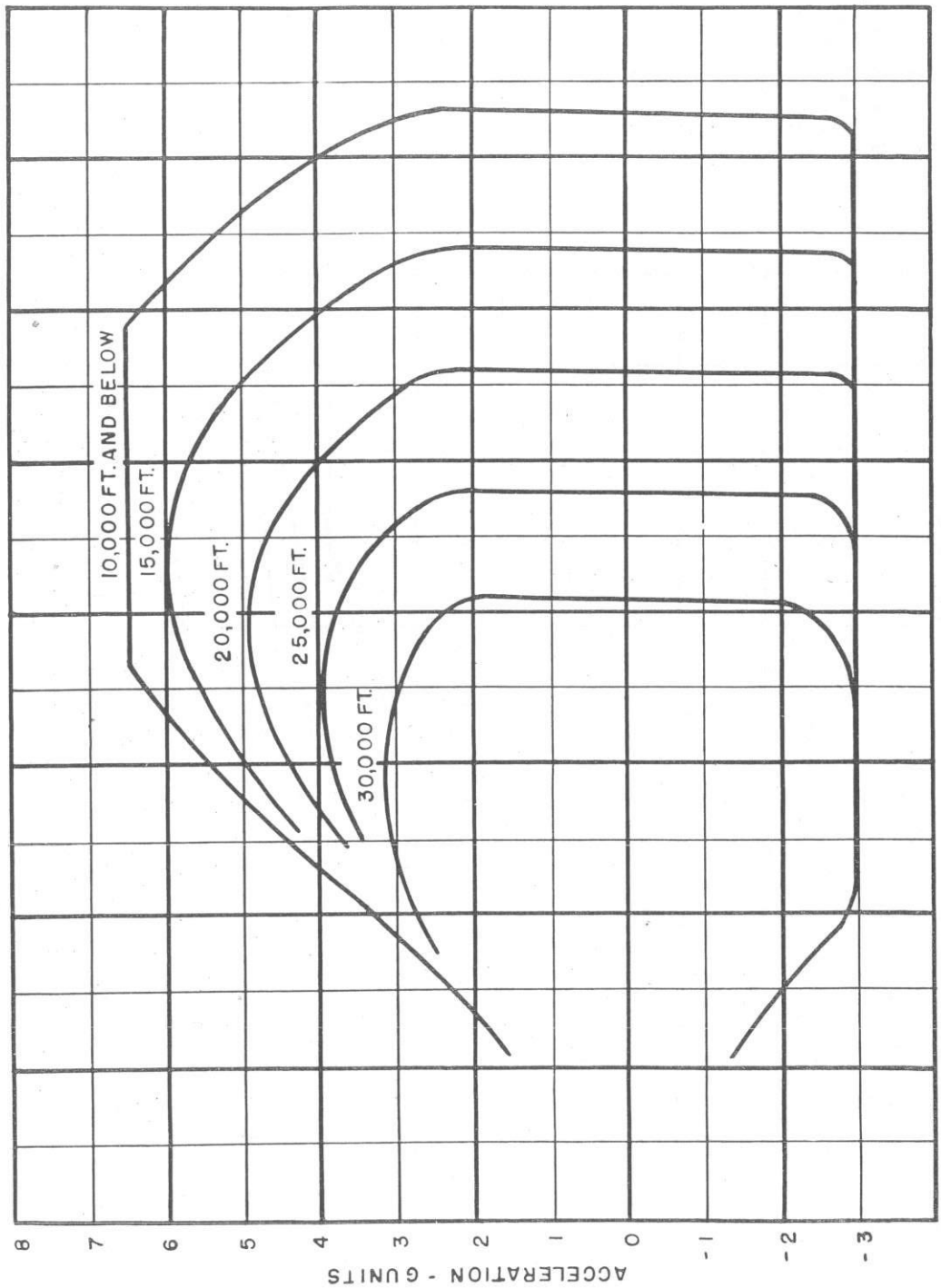


Figure A-5. Operation and Strength Flight Limitations (F6F-3, -3N)

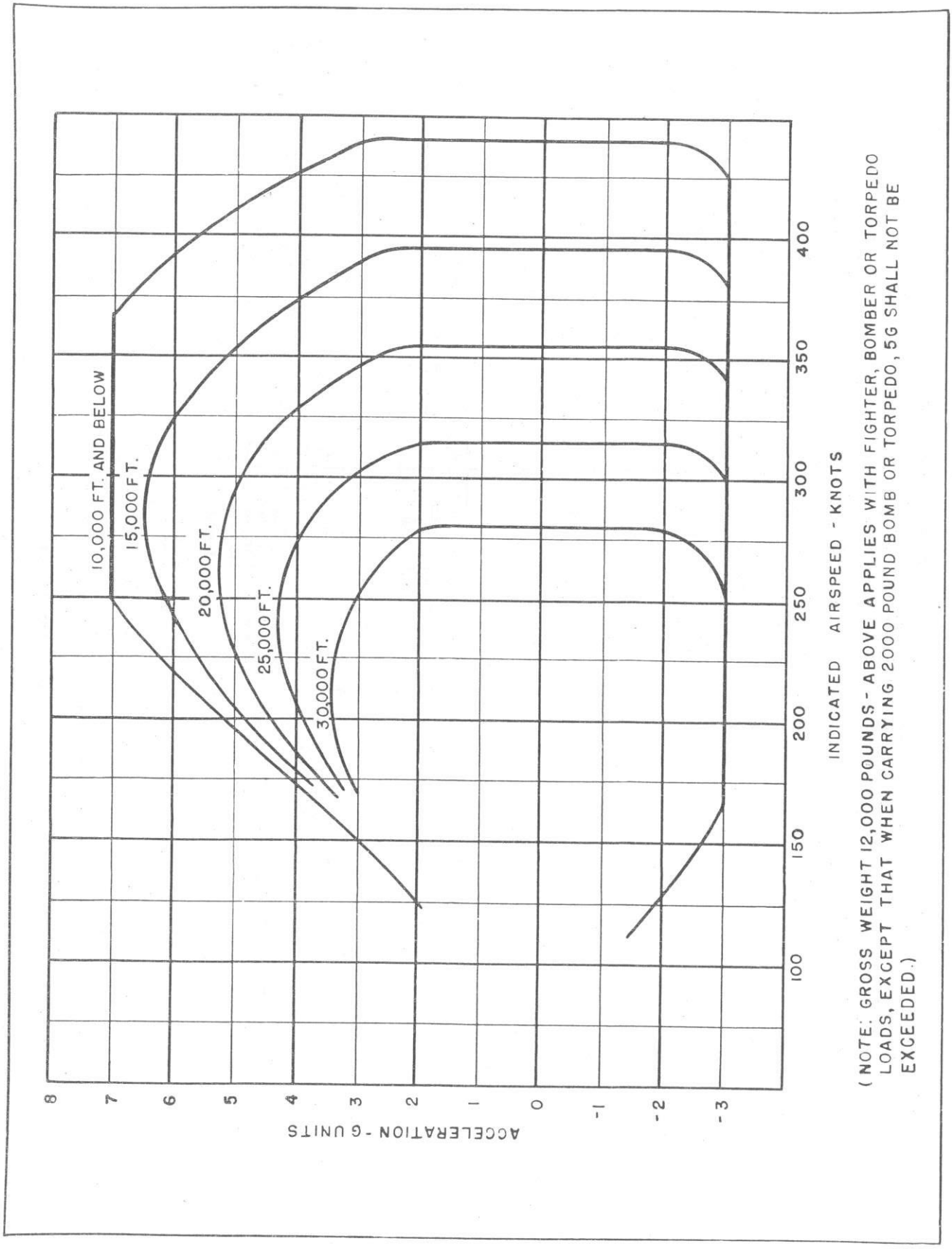


Figure A-6. Operation and Strength Flight Limitations (F6F-5, -5N)

AAFMC-528 8-1-44

AIRCRAFT MODEL(S)
F6F-3, F6F-3N, F6F-5, F6F-5N
ENGINE(S): R-2800-10, -10W

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 10900 TO 13540 POUNDS

EXTERNAL LOAD ITEMS
1-150 GALLON DROP TANK
NUMBER OF ENGINES OPERATING:

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2700	60	N		5		
	2700	60	L		5		
	2700	60	H		5		
MILITARY POWER	2700	52.5	N		30	260	
	2700	53.0	L		30	260	
	2700	49.5	H		30	260	

FOR DETAILS SEE POWER PLANT CHART (FIG. 39 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL A.R 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 STAUTE	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.	SEE NOTE (2) COLUMN V (2) RANGE IN AIRMILES STATUTE	SEE NOTE (2) COLUMN V (2) RANGE IN AIRMILES NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
		75	200	174	207	180	215	187			
		150	400	348	414	359	429	373			
		250	668	580	690	599	715	621			
		350	935	812	966	840	1002	870			

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(2.67 STAT. (2-32 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(2.76 STAT. (2.40 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(2.86 STAT. (2.48 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
2550	H FT		137	308	267	40000																				40000		SEE	NOTE	(2)		
	H FT		175	347	301	35000	2300	H 34		111	299	260	2250	L 34		105	290	252								35000	2250	H 34		96	273	237
						30000																				30000						
2550	H49.5	AL	213	351	305	25000	2300	L 36	AL	106	283	246	2250	L 34	AL	100	277	241	2250	L 34	AL	95	272	236	25000	2100	L FT	AL	90	263	228
	L49.5		220	335	291	20000	2200	L 36		100	265	230	2200	L 34		96	263	228	2050	L 34		88	255	221	20000	1850	L FT		76	226	196
	L49.5		217	311	271	15000	2200	L 36.5		89	245	213	2100	L 34		87	241	209	2000	L 34		83	236	205	15000	1750	L 34		74	218	189
2550	L49.5		215	290	252	10000	2100	N 34		87	233	203	2000	N FT		81	224	195	1900	N FT		73	209	182	10000	1850	N FT		67	195	169
	N44		172	269	234	5000	2000	N 34		80	212	184	1900	N 34		75	206	179	1650	N 34		65	185	161	5000	1550	N 34		62	177	154
	N44		156	248	216	S.L.	2000	N 34		73	195	169	1700	N 34		66	183	159	1500	N 34		59	170	148	S.L.	1350	N 34		53	153	133

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG.)
PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) THESE VALUES OF RANGE ARE FOR 20,000 FT. ONLY. THE NUMBER OF MILES PER GALLON IS GREATEST AT 20,000 FEET.

EXAMPLE

AT 13000 LB. GROSS WEIGHT WITH 100 GAL. OF FUEL
(AFTER DEDUCTING TOTAL ALLOWANCES OF 300 GAL.)
TO FLY 300 STAT. AIRMILES AT 8000 FT. ALTITUDE
MAINTAIN 2100 RPM AND 34 IN. MANIFOLD PRESSURE
WITH MIXTURE SET: AL IN NEUTRAL BLOWER

LEGEND

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

DATA AS OF 2/12/46 BASED ON: FLIGHT TEST

RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure A-7. Flight Operation Chart

AAFHC-527 4-1-46

AIRCRAFT MODEL(S)

F6F-3, F6F-3N
F6F-5, F6F-5N

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S)

R-2800-10, -10W

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.
11338	0	0	768	1203	939	1496	1043	1738	791	1226	962	1522	1088	1783	843	1278	1039	1599	1170	1865
	17.3	15	502	786	627	1000	714	1191	516	800	644	1019	745	1220	551	834	695	1070	801	1278
	34.5	30	280	439	362	577	428	712	289	448	371	587	446	731	308	466	401	617	480	766
	46.1	40	165	259	224	358	273	455	170	264	230	364	285	467	181	275	248	382	306	489
13508	0	0	1145	1778	1495	2513	1836	3247	1190	1823	1543	2561	1925	3382	1290	1923	1668	2706	2100	3557
1-150 Gallon	17.3	15	782	1214	1188	2000	1473	2643	813	1247	1226	2040	1550	2720	881	1313	1340	2150	1690	2862
Fuselage Drop	34.5	30	473	734	643	1080	824	1480	491	754	663	1100	898	1520	533	795	726	1163	945	1600
Tank	46.1	40	305	472	425	716	567	1020	316	485	440	730	597	1050	343	512	481	770	651	1100

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

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

DATA AS OF BASED ON:

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				
	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	MPH	KTS		TIME MIN.	FUEL USED	MPH	KTS		TIME MIN.	FUEL USED	MPH	KTS		TIME MIN.	FUEL USED	MPH	KTS		TIME MIN.	FUEL USED
13503 (1-150 Gallon Drop Tank)	150	130	2070	14	150	130	1890	2.8	27	150	130	1560	5.7	42	150	130	1340	9.0	55	150	130	1120	12.8	68	150	130	760	17.6	81

POWER PLANT SETTINGS: (DETAILS ON FIG. SECTION III):

DATA AS OF 2-14-46 BASED ON: FLIGHT TEST

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

LANDING DISTANCE FEET

GROSS WEIGHT LB.	BEST IAS APPROACH				HARD DRY SURFACE						FIRM DRY SOD						WET OR SLIPPERY					
	POWER OFF		POWER ON		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET		AT SEA LEVEL		AT 3000 FEET		AT 6000 FEET	
	MPH	KTS	MPH	KTS	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUNC ROLL	TO CLEAR 50' OBJ.

DATA AS OF BASED ON:

OPTIMUM LANDING IS 80% OF CHART VALUES

REMARKS:

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

RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

LEGEND

I.A.S. : INDICATED AIRSPEED
M.P.H. : MILES PER HOUR
KTS. : KNOTS
F.P.M. : FEET PER MINUTE

Figure A-8. Take-off, Climb and Landing Chart