PILOTS HANDBOOK

OF

FLIGHT OPERATING

INSTRUCTIONS

FOR

NAVY MODELS

F6F-3, F6F-3N

F6F-5, F6F-5N

AIRPLANES

NOTE: 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 3 - Airplane - Front View, Wings Folded

SECTION I

DESCRIPTION

1. AIRPLANE.

a. GENERAL.-The airplane is a Class VF single engine, single place, folding low wing fighter designed to take off from the deck of an aircraft carrier and land either in an arresting gear or on land. It is equipped for catapulting from a carrier deck.

b. DIMENSIONS.-The over-all dimensions of the airplane are as follows:

Length	33 ft. 10 in.
Height (propeller in 3 pt. position)	14 ft. 5 in.
Span (wings - spread)	42 ft. 10 in.
Span (wings - folded)	16 ft. 2 in.

2. POWER PLANT.

The engine is a Pratt & Whitney Twin Row Model R-2800-10, 18 cylinder, two stage radial, geared 2:1. Take-off rating, 2000 BHP at 2700 RPM at sea level. Recommended grade of oil varies with prevailing temperature. Follow latest service instructions and applicable technical orders.

FUEL - Grade 100/130 AN-F-28.
OIL - Grade 1120, Spec. AN-VV-O-466a.

3. PROPELLER.

The propeller is a three bladed Hamilton Standard Hydromatic, 13'1" diameter. The basic propeller pitch settings at the 42" radius are:

Low Pitch - 26° High Pitch - 65°

4. PILOT PROTECTION.

The pilot is protected forward and aft by armor plate, also by a bullet proof windshield. Enemy gun fire originating within the areas illustrated in Appendix I should not reach the pilot.

5. ARMAMENT.

The armament consists of six .50 calibre machine guns located in the outer wing panels with a maximum of 2400 rds. of ammunition. Two 1000# bombs can be carried under the center section or one full sized torpedo under the belly. When the airplane is operating with the torpedo or 1000# bomb under the belly, 100 gallon droppable fuel tanks can be carried under the wing center section.

Figure 4 - Sliding Hood Lock Control

6. ACCESS TO AIRPLANE.

Access to the cockpit is gained from the right hand side of the airplane. Push in the button (see Figure 4) located just below the windshield then slide hood aft.

7. COCKPIT SEAT.

Upon gaining access to the cockpit adjust the seat to the necessary height. The control lever for vertical adjustment is located on the right hand side of the seat; maximum adjustment is 6". The control lever for adjustment of the shoulder type harness is located on the left hand side of the seat. Make certain the harness straps are over the crossbar.

8 OXYGEN SYSTEM.

a. The shatterproof oxygen cylinder of 514 cu-in. capacity is located on the aft side of the crash bulkhead. The cylinder should be charged to 1800 lbs. per sq. in. The shut-off valve handwheel extension is located to the left of the pilot's seat.

b. The diluter demand type regulator with breathing tube and facepiece is located on the bulkhead to the left of the pilot's seat. Refer to Section V.

ROTATE HANDWHEEL COUNTER-CLOCKWISE - TO CLOSE
ROTATE HANDWHEEL CLOCKWISE - TO OPEN

9. FUEL SYSTEM.

a. TANKS.-There are two main fuel cells located left and right of the center line of the wing center section. The reserve cell is located in the fuselage under the pilot's seat. A 150 gallon droppable steel tank is carried under the belly of the airplane. Two 100 gallon droppable fuel tanks can be installed on the 1000# bomb racks located under the wing center section.

TANK CAPACITIES

Left Main	- 87.5 U.S. gals.	72.9 Imperial gals.
Right Main	- 87.5 U.S. gals.	72.9 Imperial gals.
Reserve	- 75.0 U.S. gals.	62.5 Imperial gals.
Droppable	-150.0 U.S. gals.	124.9 Imperial gals.

b. RESERVE TANK WARNING LIGHT.-The reserve tank fuel level warning light is located on the fuel control panel on the left hand side of the cockpit. When the reserve tank contains 50 gallons or less the light will glow. The fuel quantity gage shall then be closely watched and the pilot shall fly at the most economical speed, if possible.

LEAVE LAMP ON BRIGHT - ROTATE TO DIM.

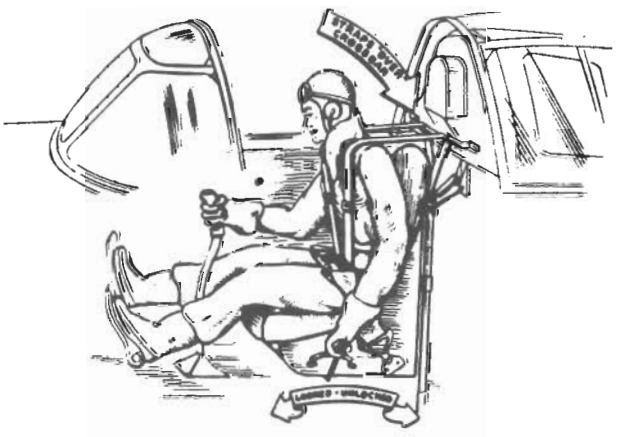


Figure 5 - Harness Strap Adjustment

c. FUEL TANK SELECTOR VALVE.-The fuel tank selector valve dial has the following designations, reading counter-clockwise: OFF
LEFT MAIN
RESERVE
RIGHT MAIN
DROPPABLE

Figure 6 - Fuel Tank Selector Valve

The vapor return line from the carburetor leads to the right main tank, and may discharge as much as eight gallons of fuel per hour.

NOTE

To prevent overflow, when operating with full right main tank, always use about 15 gallons from it before drawing fuel from other tanks.

d. AUXILIARY ELECTRIC FUEL PUMP SWITCH.-This switch is located on the left hand side of the cockpit forward of the engine control quadrant. The switch shall be ON when starting engine, when shifting from one fuel tank to another, and at any other time when use of auxiliary pump is necessary to maintain adequate and steady fuel pressure required for proper engine operation.

e. DROPPABLE FUEL TANK SWITCH.-A spring loaded switch is located on the left hand side of the cockpit just above the cowl flaps control. A safety guard is provided to prevent inadvertent operation.

f. FUEL PRESSURIZING SYSTEM CONTROL.-The 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.

PULL TO RELEASE PRESSURE
PUSH TO RESTORE PRESSURE

NOTE

The pressurized system is effective at altitudes above approx. 12000 ft. and is used for operations at higher altitudes than otherwise can be realized with the use of the auxiliary fuel pump only and for high altitude economical cruising. In combat, the pressurized system shall be disengaged and the altitude maintained with the use of the auxiliary electric fuel pump. In event that it is essential to use the pressurized system for satisfactory engine operation, any puncture of the fuel cell necessitates turning off the pressurized system for at least one minute prior to re-use to effect satisfactory sealing of the self-sealing cells.

FUEL PRESSURE

Desired	17 p.s.i.
Allowable	- 16-18.5 p.s.i.
Minimum Idling	7 p.s.i.

g. FILLER CAPS.-On left hand side of fuselage for left main, on right hand side for right main and reserve.

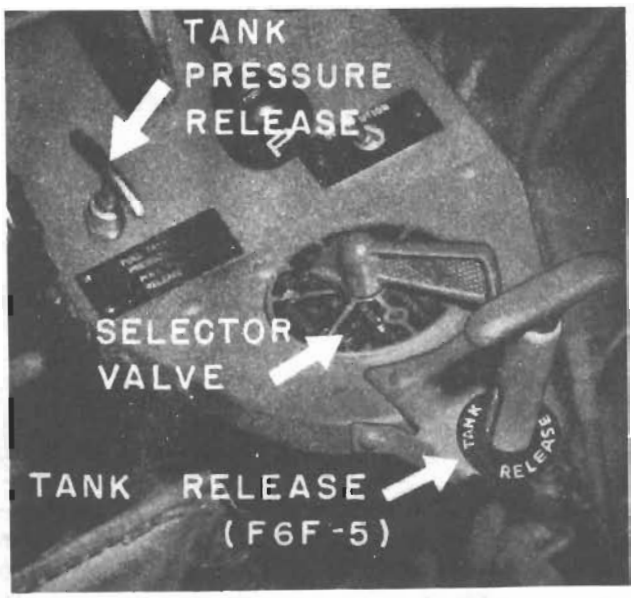


Figure 7 - Fuel Control Panel

10. OIL SYSTEM.

a. TANK.-The oil tank is located in the upper part of the engine accessory compartment, just forward of the firewall. Access is gained to the filler neck and sounding rod by releasing the Dzus-fastened door located on the left hand side of the engine cowling. The maximum filling capacity of the tank is 19 U.S. gallons leaving a three gallon foaming space. The tank is provided with a warm-up compartment.

b. TEMPERATURE CONTROL VALVE.

(1) The oil system incorporates an automatic rotary oil temperature control valve installed on the oil cooler. This valve, in conjunction with the cooler, maintains the oil-in temperature at approximately 71°C (160°F) to 79°C (175°F). The shutter which controls flow of cooling air to the air cooler is manually operated. The oil cooler shutter and intercooler flaps open and close together, and are operated by the same control. On the F6F-5 airplane these units have individual controls.

(2) The control valve causes the oil to bypass 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 virtually by-passed when starting the engine, until the oil-from-engine temperature reaches approximately 54°C. The oil is then passed through the core of the cooler and returned to the top of the oil tank.

(3) When the engine is not operating, a check valve unit prevents oil flow from the tank to the engine and back through the oil-out line from the engine to the control valve.

OIL INLET TEMPERATURES

	°C	°F
Min. for Take-off & flight	40	104
Desired	70-85	158-185
Maximum level flight	85	185
Maximum Climb	100	212

OIL PRESSURES

	p.s.i.
Desired, at 2000 RPM at 60°C	75-90
Min. at rated RPM at 100°C	75
Min. at 2100 at 85°C	60
Min. at 1200 at 85°C	50
Min. Idling	25

c. OIL DILUTION SWITCH.-The oil dilution switch is located on the fuel control panel. For oil dilution procedure see Section II.

11. HYDRAULIC SYSTEM.

a. GENERAL.-This airplane is equipped with a hydraulic system for the operation of the following units:

(1) Wing Flaps.

(2) Cowl Flaps.

(3) Landing Gear - Main and Tail Wheels.

(4) Intercoolers and Oil Cooler Shutters.

(5) Wing Hinge Locking Pins.

(6) Gun Charging.

The hydraulic reservoir filling level capacity is 1.7 gallons. Use fluid, ANA Specification AN-VV-O-366 (red color).

b. NORMAL OPERATION.-The hydraulic system is normally operated by the engine driven hydraulic pump, and its various functions are governed by hydraulic selector control valves. The normal hydraulic system operating pressure is 1500 p.s.i., and the normal pump pressure is zero except when operating some circuit (1500 p.s.i.). The system pressure gage is located on the right hand shelf.

c. AUXILIARY OPERATION.

(1) The hydraulic hand pump is located on the cockpit floor to the right of the pilot's seat. Use this pump to operate the system if the engine driven pump is not functioning. When the hydraulic hand pump is used, the hydraulic hand pump selector valve control must first be turned to the desired position marked on the adjacent nameplates. This control is located on the right hand cockpit shelf. When this selector valve is moved, the system pressure gage indicates the pressure in the particular hydraulic circuit selected. Thus, if the valve is kept on SYSTEM, the system gage will indicate malfunctioning of the engine pump if pressure falls below 1200 p.s.i. Also a malfunctioning of any circuit may be found by watching this gage while moving the selector from point to point. The positions of the lever for the operation of the various controls are as follows:

(a) System.

(b) Wing Flaps Only.

(c) Landing Gear Only.

(d) Gun Charging, Wing Hinge Lock, Engine Cowl Flaps.

Figure 8 - Hydraulic Hand Pump Selector Valve

NOTE

When this control lever is not being used to operate one of the above hydraulic units, keep it on the SYSTEM position.

(2) 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.

12. WING FOLDING & SPREADING.

a. GENERAL.

(1) 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 lever valve control operating the locking pins, is located on the right hand shelf. The wing safety lock pins are operated by a "T" handle control located on the lower center control panel. This control is 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 lock pins, when engaged, prevent the main locking pins from disengaging, regardless of hydraulic pressure.

(2) As the safety lock pins are withdrawn during the folding operation, red warning cylinders appear through the upper surface of the wing center section, one on the left and the other on the right hand side. Before take-off, check the cylinders which will be flush with the wing surface if the wings are spread and locked properly.

b. TO FOLD WINGS.

(1) Wing Flaps - UP.

(2) Disengage Safety Lock Pins - To Unlock, push "T" handle LEFT & FULL UP.

(3) Push lever on Wing Folding Hydraulic Valve Control operating the main locking pins to FOLD position - FORWARD.

(4) Operate hydraulic hand pump if engine is not running. Hand pump selector on SYSTEM or WING LOCK position.

(5) Push wing panel back until folded lock engages.

CAUTION

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.

c. TO SPREAD WINGS.

(1) Wing Flaps - UP.

(2) Push lever on wing folding hydraulic valve control operating the main locking pins to SPREAD position - AFT.

(3) Release jury lock pin lock control handle located in the wheel well.

CAUTION

Lift wing tips when releasing jury lock pin before spreading outer panels.

(4) If engine is not running, place hand pump selector valve on SYSTEM and pump until system gage reads about 1500 p.s.i., 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 sure pins are FULLY HOME.

(5) Engage Safety Lock - to LOCK, push "T" handle FULL DOWN and RIGHT.

(6) Check red warning flag to make sure of its retraction flush with top surface of wing.

WARNING

Do not allow the wings to fall free when spreading as damage may result to the wing folding axis.

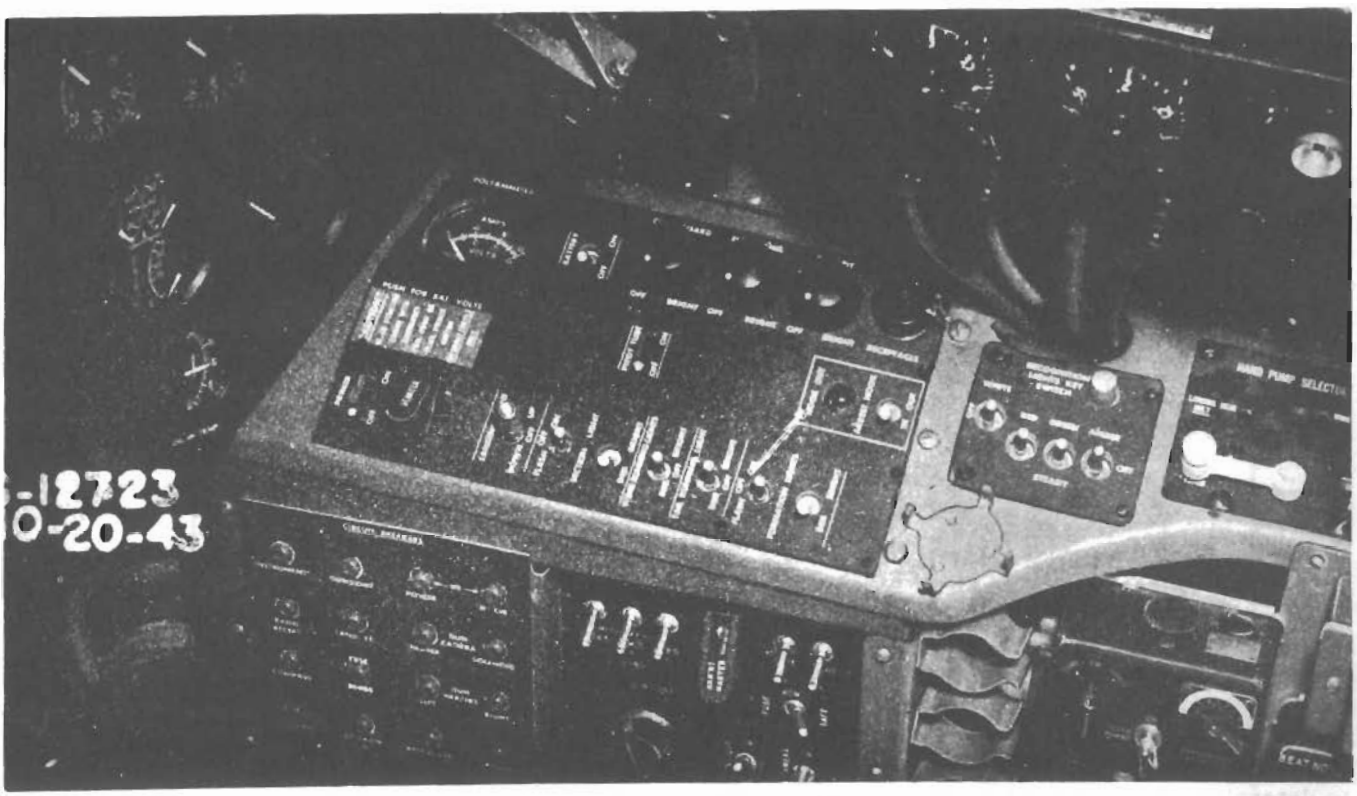


Figure 9 - Main Electrical Distribution Panel - F6F-3

13. ELECTRICAL SYSTEM.

a. DESCRIPTION.-The electrical system includes generator, battery, switches, rheostats, circuit breakers and lights controlled mainly from the electrical distribution panel and switch box. The following units operate electrically:

WING FLAPS VALVE	GUN SELECTOR & MASTER SWITCHES
ARRESTING HOOK	GUN TRIGGER SWITCH
PRIMER	GUN CAMERA
AUXILIARY FUEL PUMP	GUN SIGHT
LIGHTS	GUN HEATING (AUTOMATIC)
COCKPIT HEATER	DROPPABLE FUEL TANKS-RELEASE
PITOT TUBE HEATER	FUSING & SELECTING OF BOMBS
	BOMB RELEASE

b. GENERATOR & BATTERY.

(1) The generator normally supplies the current for the electrical system, and is the sole source of power for normal operation of the electrical units, after the engine has started.

(2) The battery switch, located on the electrical distribution panel, has two positions: ON and OFF. Battery switch must be in OFF position before leaving airplane. Recognition Lights and Radio Control Switches are not affected by this switch. They are energized regardless of battery switch position with their respective control.

NOTE

The battery switch must be ON to prime and start the engine.

c. ELECTRICAL DISTRIBUTION PANEL & 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, which is located on the right hand cockpit shelf. Operation of the controls on the electrical distribution panel is directed by the instructions printed on the adjacent nameplates.

SWITCHES

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

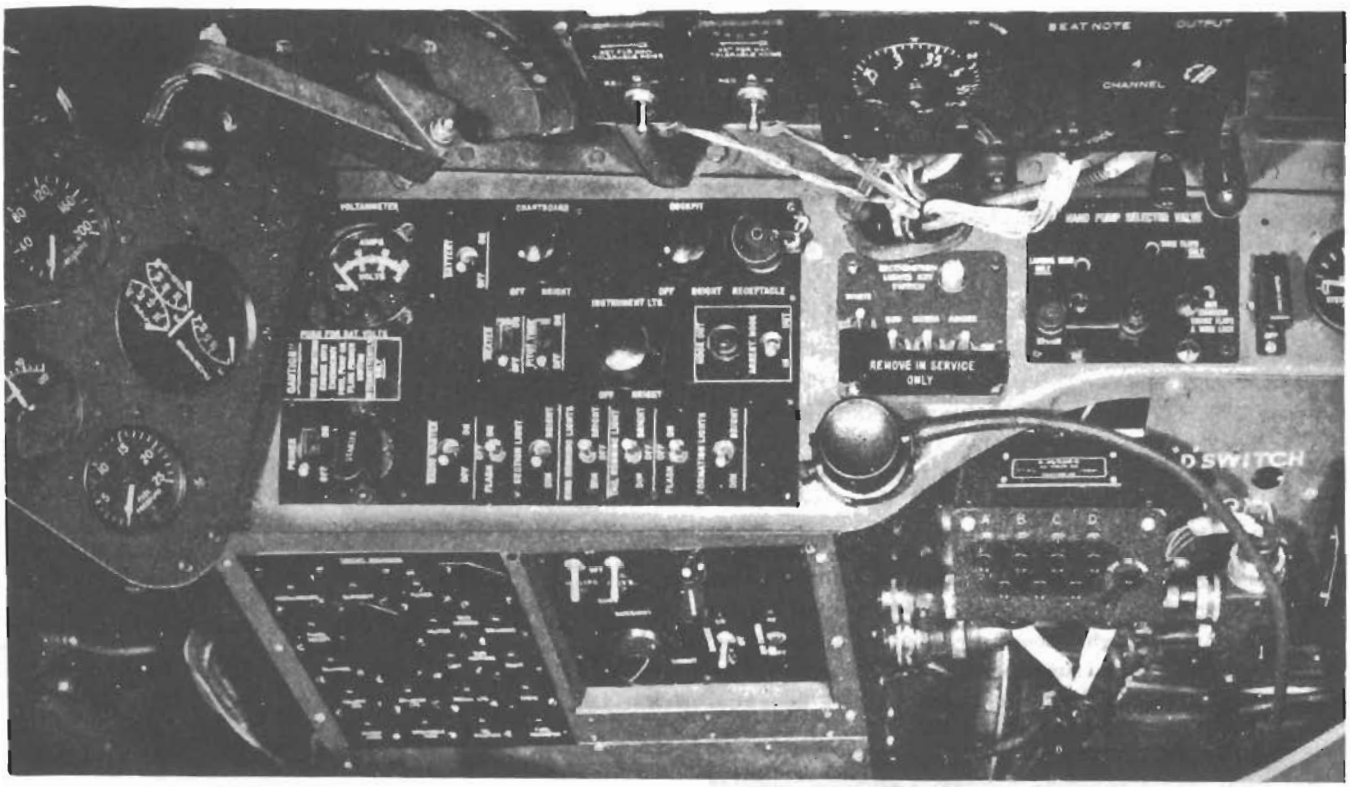


Figure 10 - Main Electrical Distribution Panel - F6F-5

RHEOSTATS - LIGHTS

Chartboard	Cockpit
Electrical Panel	Gun Sight

CIRCUIT BREAKERS (MANUALLY RESET)

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

d. VOLT-AMMETER.-The volt-ammeter is located on the electrical distribution panel. It normally shows generator amperes. Battery volts may be read by pushing the button on the face of the meter when the engine is not running over the generator cut-in speed. System volts are read when the generator is operating at engine speeds above 1300 RPM.

e. 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 electrical 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.

f. EXTERIOR LIGHTS.-The exterior lights are controlled from the electrical distribution panel.

Landing	Wing Running
Section	Tail Running
	Formation

NOTE

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

g. FLUORESCENT LIGHTS.-The fluorescent lights are controlled by rheostats located on the lower center instrument panel. To start the lights, turn

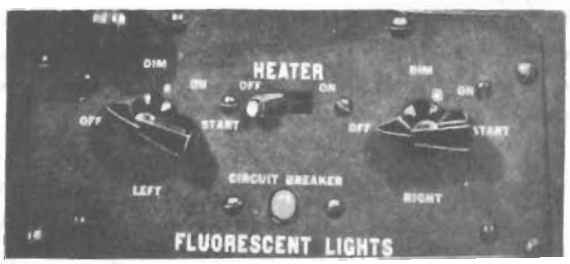


Figure 11 - Fluorescent Lights Control - F6F-3 Only

the rheostats from the OFF to the START position, and hold there for a few seconds until the lights turn ON. Then, turn the rheostat to dim or bright position. 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.

h. 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 OFF position.

i. 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 airplane, spare instrument panel bulbs are located on the left hand side of the instrument panel.

Figure 12 - Recognition Lights Control

j. RECOGNITION LIGHTS SWITCHES.-The recognition lights and keying switches are located on the right hand shelf. A switch is provided to select each light as desired. Throwing any switch opposite the steady position will not cause the light to glow until the recognition lights keying switch is operated. If any light fails to operate, the circuit breaker, for this circuit located on the panel, should be pushed.

k. PITOT TUBE HEATER. - The pitot tube heater switch is located on the distribution panel. This switch shall be turned 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.

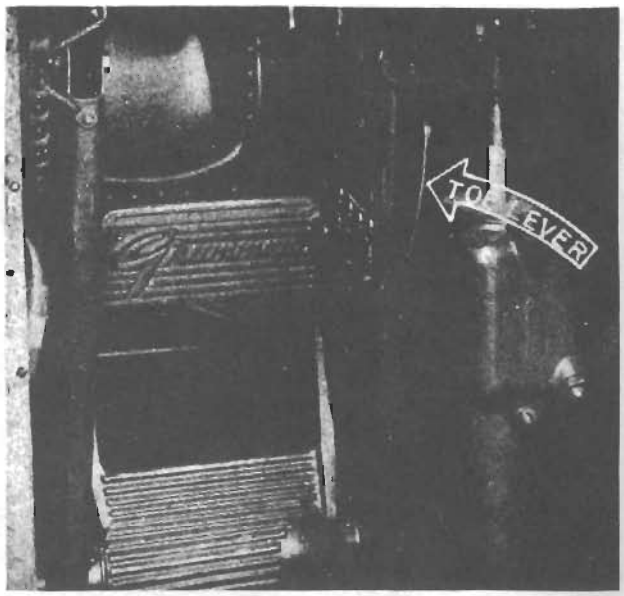


Figure 13 - Rudder Pedal Adjustment Lever

14. CONTROLS.

a. AIRPLANE CONTROLS.

(1) RUDDER CONTROL.-The rudder pedals are suspended from a horizontal bar below the instrument panel. See Figure 13. The pedals are adjustable to four positions by a toe lever on each inner pedal arm. With toes on adjustment levers, push pedals all the way FORWARD, then with toes under pedals bring AFT one notch at a time until desired position is attained. Check that each pedal has ratcheted past the same number of notches. Adjustment of the rudder pedals automatically adjusts the brake pedals to the same relative position.

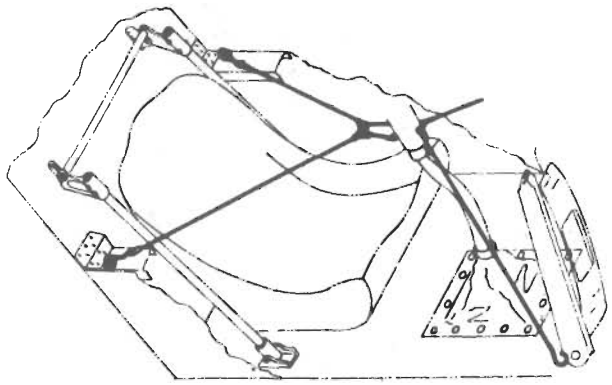


Figure 14 - Surface Controls Locking Device

(2) AILERON AND ELEVATOR CONTROLS.-A conventional type stick, equipped with pistol type grip provided with gun trigger and bomb button is installed in the airplane. To lock controls neutralize rudder pedals and hook up the lashing device.

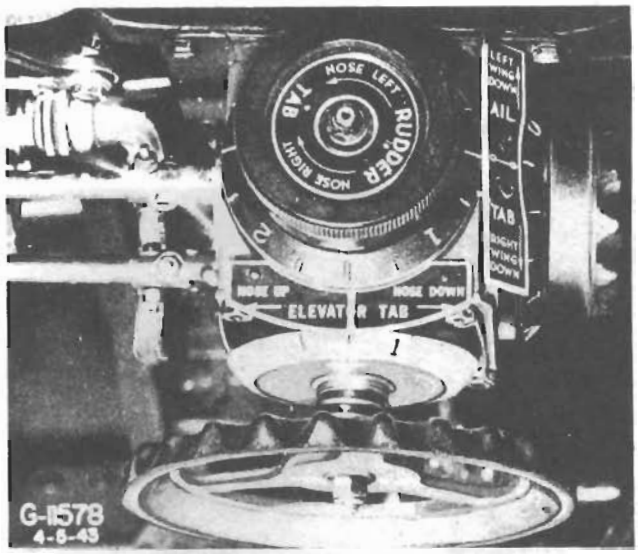


Figure 15 - Trim Tab Controls

(3) 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.

NOTE

On the F6F-5 airplane the ailerons are equipped with spring tabs to lighten the control forces. Their operation is completely automatic. The left aileron tab also operates as a trim tab in the usual manner.

(4) WING FLAP CONTROL SYSTEM.

(a) GENERAL.-The wing flaps, of the low drag type, are actuated by four hydraulic cylinders controlled from the pilot's cockpit. Two cylinders are installed in each wing, one inboard and one outboard.

(b) HYDRAULIC CONTROL VALVE.-During normal conditions the flap hydraulic control valve, governing the cylinders, is operated by an electric servo motor controlled by a toggle switch located on the left hand shelf, adjacent to the control quadrant.

SWITCH FORWARD - FLAPS UP

SWITCH AFT - FLAPS DOWN

If electric power fails, the flaps are controlled by the wing flap manual control lever located on the lower left hand side of the cockpit. If the normal hydraulic pressure system fails, the flaps are controlled by the auxiliary hydraulic pressure system, i.e., the hydraulic hand pump located to the right of the pilot's seat in conjunction with the hydraulic hand pump selector valve located on the right hand cockpit shelf.

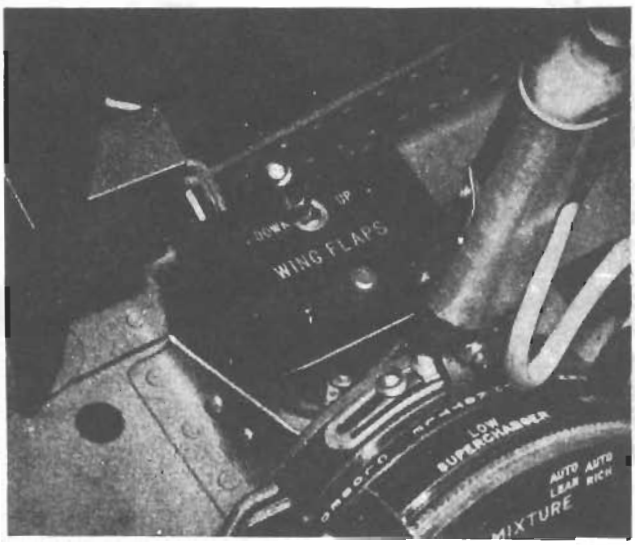


Figure 16 - Wing Flaps Electric Control Switch

(c) COMPRESSION SPRING UNITS.-Four blow-up spring units, one connected to each flap, are arranged to allow the flaps to "blow-up" with increasing airspeed. These automatically control the flap angle in flight when the flap linkage is all the way out, i.e., when the flaps are down. This feature is not controllable from the cockpit and is entirely independent of the hydraulic cylinders. The range of flap angle is 50° at 93 Knots airspeed and up to 15° at 150 Knots airspeed.

NOTE

If the wing flaps fail to operate electrically, push the circuit breaker reset button adjacent to switch to restore power; if they still do not function, operate the manual flap control located to the left of the cockpit seat.

(d) AUTOMATIC CONTROL SYSTEM.-The flaps will not come down at speeds in excess of 170 Knots even though the electric control switch is in the FLAPS DOWN position. An airspeed switch, located in the wing center section, is connected in parallel with the airspeed indicator. The airspeed switch will automatically retract the flaps when the airspeed exceeds 170 Knots. If the flap switch is left on the FLAPS DOWN position, this switch will extend the flaps again when the airspeed drops below 170 Knots.

(e) MANUAL CONTROL (AUXILIARY).-In the event of electric power failure, the flaps are raised or lowered by operating the spring loaded control lever located on the lower left hand side of the cockpit.

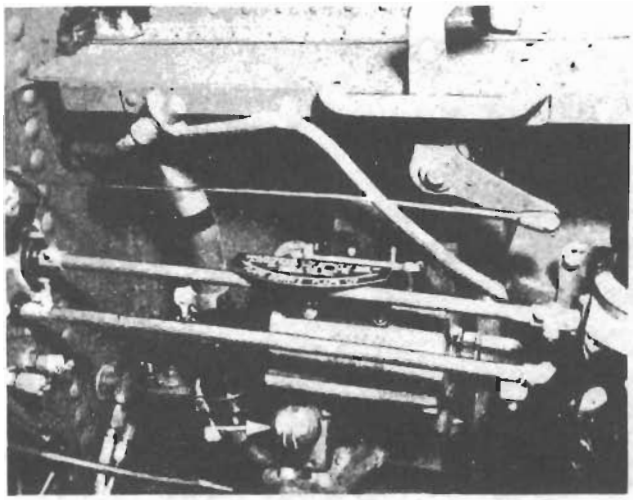


Figure 17 - Wing Flap Manual Control

PUSH DOWN & FORWARD - FLAPS UP

PUSH DOWN & AFT - FLAPS DOWN

CENTER - NEUTRAL

WARNING

It is important to press the red handle down to disconnect motor then move red handle forward or aft. If this handle is forced without first pressing it down, serious damage will result to the electric motor splined shaft and the rubber clutch. After operating the flap control manually and electric power is restored, put handle in neutral position.

The above control applies to airplanes Bu. Aero numbers 04789 and subsequent.

(f) EMERGENCY OPERATION.-In the event the engine driven hydraulic pump is not operating, the wing flaps are raised or lowered by operating the hydraulic hand pump in conjunction with the hydraulic hand pump selector valve located on the right hand cockpit shelf. (See paragraph 11, Hydraulic System.)

1. Flap Switch - DOWN or UP as required.

or

2. Manual Control Lever located on the left hand side of cockpit - in flaps DOWN or UP position as required, if electric power has also failed.

3. Lever on hand pump selector valve, located on the right hand cockpit shelf - WING FLAPS.

4. Operate hydraulic hand pump. There are approximately 35 double strokes required to extend the cylinder and approximately 25 double strokes required to retract it.

NOTE

Keep hand pump selector valve control on SYSTEM position when not being used.

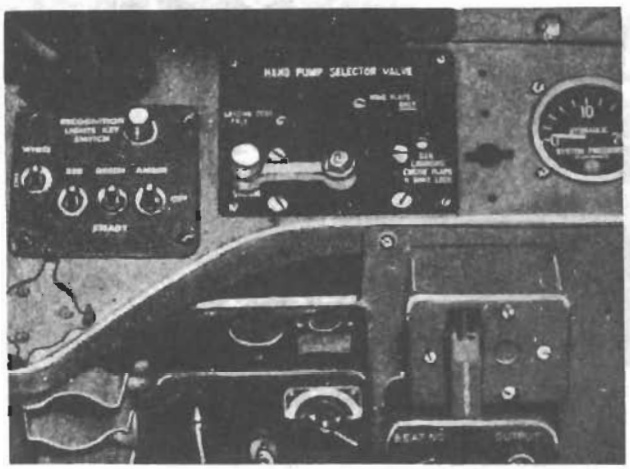


Figure 18 - Hand Pump Selector Valve

(5) LANDING GEAR CONTROLS.

(a) GENERAL.-The airplane is equipped with hydraulically operated main and tail wheels which are retracted or extended by double acting hydraulic cylinders. The operating pressure is normally supplied by the engine driven hydraulic pump or by the hand pump for auxiliary operation. An air cylinder supplies pressure for emergency extension of the wheels.

(b) NORMAL OPERATION.-The main and tail wheels are normally retracted or extended by manual operation of the two position square knob control lever located on the left hand instrument panel. This square knob lever is distinct in appearance from any other control, being designed to prevent inadvertent retraction or extension of the landing gear by the pilot in flight.

LEVER UP - WHEELS RETRACTED

LEVER DOWN - WHEELS EXTENDED

CAUTION

Make certain landing gear control lever is in fully lowered position before take-off and landing.

NOTE

The landing gear will not lower completely above 135 Knots indicated airspeed.

(c) AUXILIARY OPERATION.-In the event that the engine driven hydraulic pump is not operating

the main and tail wheels may be retracted or extended by operating the hydraulic hand pump in conjunction with the hand pump selector valve on the right hand shelf. Set the square knob control lever to the desired position, move the hand pump selector valve lever to LANDING GEAR and operate hand pump. Approximately 90 double strokes required to Raise; Approximately 70 double strokes required to Lower.

NOTE

When lowering by hand pump, considerably less effort will be required if the airspeed is reduced to 100 Knots or less.

(d) EMERGENCY OPERATION.

1. In the event of complete hydraulic system failure, the main and tail wheels may be fully extended and locked by manual operation of the landing gear emergency release "T" handle control located on the lower center control panel. The emergency landing gear extending system consists of the "T" control handle, an air bottle, valves and pipe lines.

NOTE

To EXTEND main and tail wheels, pull "T" handle FULL DOWN and LOCK. Use this control at or below 90 Knots.

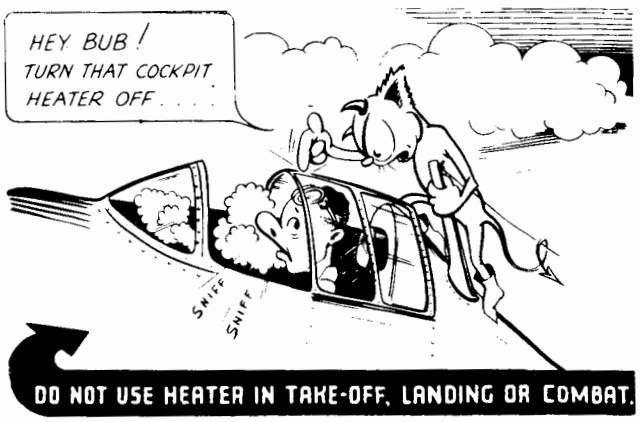
2. When the "T" handle is pulled, the up locks are released, the air system vent valve closes, the air bottle valve opens, and the ON-OFF hydraulic dump valve opens, all functioning simultaneously. This system will operate regardless of the position of the square knob control lever. No other part of 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 determined. Time required to Lower - 10 seconds approximately.

CAUTION

The wheels cannot be lowered more than once by this control therefore, do not operate it until you are sure that hand pump system will not function. If the emergency system is operated at higher airspeeds than it can overcome, the gear will come down part way and trail. Any small leak in the system might therefore dissipate enough of the limited supply of air with the result that the 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.

3. 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 placing the emergency "T" handle control back to its normal position, square knob control lever to wheels UP position, hand pump selector valve to LANDING GEAR and operating the hand pump.

4. To read the L.G. dump bottle air pressure, turn valve to open position only long enough to read gage, then close. Only a slight hand pressure is required when closing the valve. Bottle pressure **1950** p.s.i.



(e) WHEEL LOCK.

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

2. 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 microswitch operated by the lock itself connected to the position indicator in the cockpit.

(f) POSITION OF WHEELS INDICATOR.-The position of the main and tail wheels are shown on the combination flap and landing gear indicator, located on the left hand instrument panel. See No. 16, Figure 24. This indicator, in addition to showing the approximate position of each wheel, also shows whether or not they are locked up or down.

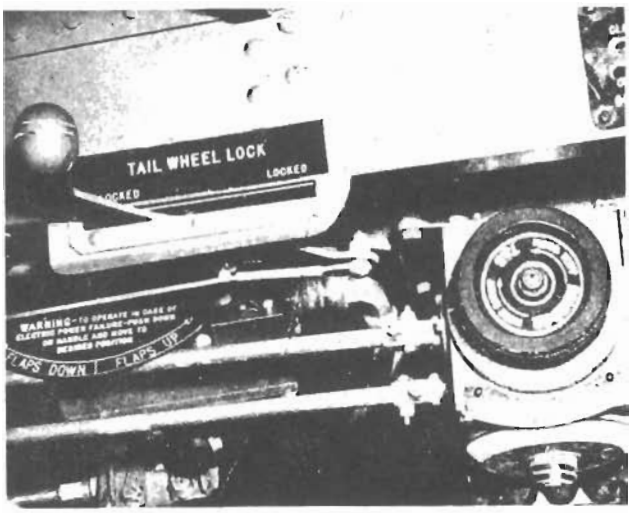


Figure 19 - Tail Wheel Lock Control

(g) TAIL WHEEL CASTER LOCK.

1. The tail wheel drag link is equipped with a lockpin which locks the caster in the trailing position. The lockpin is controllable by cable from the lock lever located on the pilot's left hand shelf. The primary purpose of the lock is to reduce the possibility of ground looping in landing.

LEVER FORWARD - CASTER LOCKED

LEVER AFT - CASTER UNLOCKED

2. Lock the tail wheel immediately after taxiing into position for take-off. The tail wheel will then remain locked during flight and during landing. Unlock after the landing run has been completed in order to facilitate taxiing.

NOTE

For carrier operation leave the tail wheel caster unlocked.

(6) ARRESTING HOOK CONTROLS.

(a) ELECTRICAL OPERATION.-The arresting hook switch and circuit breakers are located on the electrical distribution panel. To EXTEND the hook, throw the control switch to the OUT position (right). When the hook is fully extended, the light adjacent to the switch will glow. The running OUT of the hook will also turn on the approach light in the wing. If the hook fails to operate, push the circuit breaker reset button.

CAUTION

The pilot shall insure that the switch is in the hook out position prior to landing aboard a carrier.

(b) MANUAL OPERATION.-The "T" handle arresting hook emergency control is located on the bulkhead aft of the pilot's seat on the lower left hand side. This control will not retract the hook. To extend hook, pull "T" handle and release - Repeat approximately five strokes. If the arresting hook is fully extended, the pilot will be unable to pull the manual control through a full stroke.

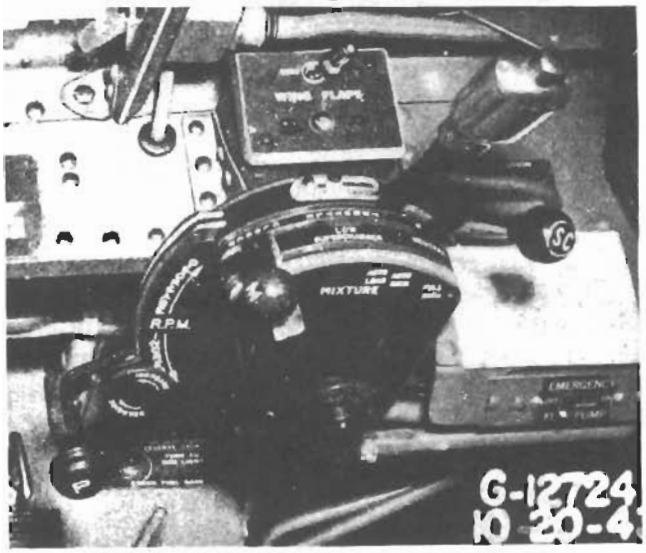


Figure 20 - Engine Control Quadrant

b. POWER PLANT CONTROLS.

(1) ENGINE CONTROL QUADRANT.-The engine control quadrant is located on the left hand shelf and is equipped with a friction adjustment handwheel, located on the inboard side, to adjust the friction on the throttle and propeller governor control levers. It contains the following controls:

SUPERCHARGER - AUXILIARY

THROTTLE, WITH MICROPHONE SWITCH

MIXTURE

PROPELLER GOVERNOR & VERNIER HANDWHEEL

(2) SUPERCHARGER CONTROL.-The supercharger control lever is located on engine control quadrant.

FORWARD	-	NEUTRAL
CENTER	-	LOW RATIO
AFT	-	HIGH RATIO

(3) SUPERCHARGER SHIFTING PROCEDURE.

(a) Do not shift the supercharger control more often than at five minute intervals, while in flight except in an emergency, to allow the dissipation of heat from the clutches. The control must be at the extremity of its travel in either

ratio to prevent clutch slippage and to insure the availability of rated power at all times. At least once during each five hour period of operation in HIGH or LOW ratio, shift to NEUTRAL for a period of five minutes to eliminate sludge accumulation in the clutches. If operations require exception to this practice, de-sludge at the earliest opportunity. Failures have resulted from oil carbonation due to excessive time between de-sludgings.

(b) To change from NEUTRAL to LOW ratio or from LOW ratio to HIGH ratio, the following procedure shall be used:

1. Retard throttle as necessary to avoid exceeding desired manifold pressure after shift.
2. Reduce RPM if practicable.
3. Shift rapidly.
4. Readjust RPM, throttle setting as necessary to obtain desired power.

(c) To shift from HIGH ratio to LOW ratio or from LOW ratio to NEUTRAL, the following procedure shall be used:

1. Shift rapidly.
2. Readjust RPM, throttle setting to obtain desired power.

WARNING

Never close throttle even momentarily (and avoid as far as possible any abrupt movement of the throttle) while operating in LOW or HIGH blower.

(d) Blower shifts should be made at the altitudes specified in the Specific Engine Flight Chart, Figure 39. The amount which the manifold pressure should be decreased before shifting to the next higher blower ratio is best learned by experience. Until familiar with the airplane, reduce the manifold pressure 3" to 4" before shifting. The amount of **surge in manifold pressure depends on how quickly the auxiliary stage regulator reacts, and this may vary with temperature conditions, and from airplane to airplane.**

(e) The auxiliary supercharger regulator permits any desired manifold pressure below military power limits to be obtained with the throttle alone when operating in the auxiliary stage (either LOW or HIGH blower) at any altitude below critical altitude. Use of the auxiliary supercharger below the recommended shift altitudes, however, will cause a rise in carburetor air temperature which is undesirable. Such use will also cause an increase in fuel consumption, because power that would otherwise be available at the propeller is wasted in driving the auxiliary stage.

(f) Under certain conditions, use of the auxiliary stage at lower altitudes than necessary will result in the phenomenon of "surge" in the auxiliary stage system. The surge is a breakdown in airflow somewhat analagous to the stalling of an airfoil. It is brought on by attempts to operate at very low airflows (small throttle opening) with high impeller speeds (high blower RPM). It is most likely to occur when all the following conditions exist:

1. Altitude - about 25000 ft.
2. Supercharger - HIGH.
3. RPM - (a) 2200, (b) 2500.
4. Manifold pressure - (a) below 30", (b) below 33".
5. Outside air temperature - 10° to 20°C below standard.

NOTE

It is important to observe that the power being used could be obtained in LOW blower.

(g) Surge will be evident by very rough engine operation, and probably by a rumbling noise or loud "puffing" sound in the ducting. The natural reaction would be to "ease up" by retarding the throttle. This would only aggravate the condition and might result in the engine quitting altogether. If the condition is recognized, it can be eliminated promptly by any one of the following courses of action:

1. Shift to the next lower blower speed, unless the tactical situation makes this undesirable.
2. Open the throttle and reduce RPM to maintain desired power.
3. Shift to alternate air.

(h) It is recommended that pilots explore the region of operating conditions described, so that they may learn to recognize supercharger surge when it is encountered. It is unlikely that it can be found unless outside air temperature is below standard. Operating for short periods in the surge range will do no harm, but it should not be allowed to continue as heavy surge may open up leaks in the intercoolers or ducting. The condition is not readily subject to correction by design change, and it is therefore desirable that pilots be thoroughly familiar with the phenomenon, and methods of dealing with it.

(4) ENGINE THROTTLE CONTROL.-The throttle control lever is located on engine control quadrant.

LEVER FORWARD - THROTTLE OPEN

LEVER AFT - THROTTLE CLOSED

(5) MIXTURE CONTROL.

(a) The mixture control has three effective positions:

IDLE CUT-OFF
AUTO LEAN
AUTO RICH

The fourth position, "FULL RICH", has been or should be rendered inoperative, and therefore no attempt should be made to use it. Fuel will be discharged into the supercharger at any fuel pressure above four p.s.i. when the mixture control is in any position except IDLE CUT-OFF. The mixture control should be kept in the IDLE CUT-OFF position whenever the engine is not running to insure against flooding of the supercharger in case the auxiliary fuel pump is inadvertently turned ON.

NOTE

Upon stopping the engine, particularly in hot weather, fuel trapped in the carburetor (with the mixture control in IDLE CUT-OFF) may boil from the residual heat of the engine. The abnormally high vapor pressure can jam rubber-tipped vapor vent needles in their seats so that faulty vapor elimination may occur during subsequent operation of the engine. Therefore, until such time as the present rubber-tipped needles can be replaced by all-steel needles, operating activities have been advised to place the mixture control in AUTO LEAN (after shutting down with IDLE CUT-OFF) until the engine and accessory compartment have cooled.

This procedure requires that adequate precautions be taken to insure that:

1. The auxiliary fuel pump is turned OFF before stopping engine.
2. The mixture control is placed in IDLE CUT-OFF as soon as practicable after the engine has cooled.
3. Neither the main battery switch nor the auxiliary fuel pump switch is turned ON until the mixture control has been checked to see that it is in IDLE CUT-OFF.

CAUTION

Failure to observe these precautions may result in hydraulic lock and rod failure, as well as an obvious fire hazard.

(b) AUTO RICH should be used for take off, landing approach, and all ground operation. It is also available for additional cooling under adverse conditions that would otherwise require a reduction in power or excessive opening of the cowl flaps to maintain cylinder head temperatures within allowable limits.

(c) AUTO LEAN should be used for all flight operations except under adverse cooling conditions as noted above.

NOTE

Unnecessary use of AUTO RICH should be avoided whenever possible because of the resulting increase in fuel consumption.

(d) Tests have shown that, when properly adjusted, present carburetor settings meter very close to best economy at 60% power and below. For this reason, manual leaning is not recommended, and should not be attempted, unless there is conclusive evidence that carburetor metering is erratic.

(e) When regular servicing and adjustment of carburetors cannot be maintained, it is recommended that frequent tank tests be run during routine flights in order to detect defective metering promptly. The following procedure is recommended:

1. "Top off" **left wing tank** just before take-off. Do not use fuel from this tank until aloft and ready to start test.
2. At usual cruising altitude, trim airplane for level flight at usual cruising IAS.
3. Set selector to test tank, and determine elapsed time (in minutes and seconds) to run tank "dry" (as indicated by drop in fuel pressure). Record elapsed time, RPM, pressure altitude, outside air temperature, and IAS during test run.
4. Immediately after landing, have test tank refilled from measuring cans or calibrated pump. Accurate measurement is essential. Record fuel required.

5. Compare fuel consumption with records of previous flights. (IAS, gross weight, configuration, power conditions, and density altitude must be approximately the same for flights compared.) A difference in fuel consumption of more than ±4% may be considered an indication of unsatisfactory metering.

CAUTION

The carburetor vent line normally returns not more than two quarts of fuel per hour to the right main tank. If either vent valve sticks, the return flow may amount to several gallons per hour, and will cause a false indication of over-richness during tank tests. A simple ground check of return flow can be made by having vent line disconnected at firewall or carburetor, and turning the auxiliary fuel pump ON. (DO NOT START ENGINE WHILE VENT LINE IS DISCONNECTED.)

(f) If over-richness is definitely shown by tests, and adjustment or replacement of the offending carburetor is not practicable, manual leaning may be used at approximately 50% power, and below, to control mixture strength. The following method should be used:

1. Fly level at desired IAS, using 32" Hg. (but not more) or full throttle, AUTO LEAN, 1300 to 1700 RPM. If IAS is too high at 32" (or full throttle) and 1300 RPM, reduce MP as necessary. Allow a few minutes for engine temperatures to stabilize, then note head temperatures.

2. Move mixture control slowly out of AUTO LEAN toward IDLE CUT-OFF until surging of RPM begins. Then move mixture control into adjacent notch toward AUTO LEAN. If this reduces surge to ±10 RPM or less, the setting is satisfactory. If surge is excessive, move mixture control one more notch toward AUTO LEAN. Repeat if necessary.

3. While making the foregoing adjustments, maintain a close watch on head temperatures. Head temperatures must not go more than 5°C above or 15°C below the head temperatures observed when using AUTO LEAN. Return mixture control to AUTO LEAN immediately if head temperatures go outside limits, and wait until temperatures stabilize before repeating attempt at manual leaning. DO NOT STOP SHORT OF AUTO LEAN when enrichment is necessary to control head temperatures. Do not exceed limit of 232°C at any time.

(g) Manual leaning at more than 50% power is not recommended, and should be avoided except in extreme emergencies. Engine damage may result when manual leaning is done incorrectly at any power, and the operation is particularly hazardous above the cruising power range.

(h) If over-enrichment develops during a flight, the usual indications are low head temperature, loss of power, and in extreme cases, a visible smoke trail. If possible, confirm suspected over-richness by a tank test before resorting to manual leaning. Indiscriminate leaning is dangerous.

Figure 21 - Propeller Control

(6) PROPELLER CONTROL.--The propeller pitch is controlled hydraulically by a governor unit located on the nose of the engine. The propeller governor control is located on the aft end of the engine control quadrant.

LEVER UP - DECREASE RPM (Increase Pitch)

LEVER DOWN - INCREASE RPM (Decrease Pitch)

Propeller vernier control handwheel located inboard of governor control.

ROTATE CLOCKWISE - DECREASE RPM (INCREASE PITCH)

ROTATE COUNTER-CLOCKWISE - INCREASE RPM (DECREASE PITCH)

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

INCREASING ENGINE POWER

1. Adjust the propeller control to obtain the desired RPM.
2. Adjust the throttle to obtain the desired manifold pressure.

DECREASING ENGINE POWER

1. Adjust the throttle to obtain the desired manifold pressure.
2. Adjust the propeller control to obtain the desired RPM.

(8) WATER INJECTION SYSTEM.

(a) TANK.-The water tank is located in the upper part of the fuselage between Stations #67-1/2 and #82-1/2. Access is gained to the fillerneck by releasing the small Dzus fastened door located on the right hand side of the fuselage just below the sliding hood railing. The filling capacity of the tank is 16 U.S. gallons (13.3 Imperial gallons).

(b) QUANTITY GAGE.-The quantity gage for this tank is located to the right of the main instrument panel. This indicator is connected electrically to a float type transmitter located in the tank.

(c) WATER PUMP CONTROL SWITCH.-This switch is located on the cockpit left hand shelf just outboard of the engine control quadrant. The switch must be put in the "ON" position prior to the use of the water injection system thereby, allowing the water pump to build up the required 17-19 p.s.i. necessary for the operation of the water injection system.

(d) WATER REGULATOR.-The 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 is located on the water regulator and this valve controls the flow in the above mentioned line. A micro-switch, located on the engine control box, controls the valve. The 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.

(9) CARBURETOR INDUCTION SYSTEM.

(a) The carburetor air induction system consists of three ducts. The main stage inlet doors are located in the engine accessory compartment, below the intercoolers. Air filters may be inserted at this point when operating under bad dust conditions. The auxiliary stage inlet duct is located in the lower section of the nose spinning. This duct also directs the cooling air to the oil cooler.

(b) The two position carburetor air control (auxiliary stage) "T" handle is located on the left hand side of the instrument panel.

"T" HANDLE FULL FORWARD - DIRECT

"T" HANDLE FULL AFT - PROTECTED AIR

This control regulates the auxiliary stage air only 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 actuate a door 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.

(c) However, when operating in auxiliary stage, with the control **set full aft, air is** drawn into the auxiliary stage from behind the engine cylinders, thereby excluding rain, atmospheric ice, or other contaminants. 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".

NOTE

The power output with the auxiliary stage engaged shall not exceed the rating for that combination of superchargers given on the Engine Operation Chart.

(d) The flow of cooling air through the intercoolers may be controlled by the intercooler shutters. Installation of a carburetor air temperature warning light is scheduled. When installed, the light will flash on whenever the carburetor air temperature reaches or exceeds 43°C (110°F).

(e) Except while operating at War Emergency Power (Section II), immediate action must be taken to reduce carburetor air temperature whenever the warning light comes ON. Failure to do so will result in detonation, and probable extensive engine

damage. Shifting to the next lower blower will produce the most rapid and effective reduction of carburetor air temperature. To avoid blower shifting, the following procedure may be tried:

1. Open intercooler flap. (Try 1/2 opening before going to full opening).
2. Reduce manifold pressure approximately 4".
3. Reduce engine speed approximately 150 RPM.

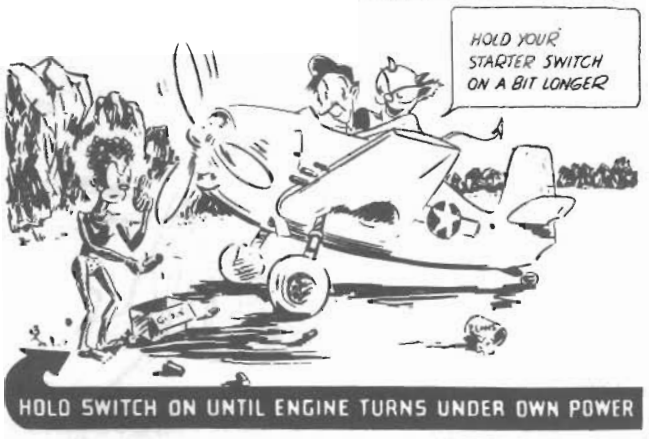
If warning light fails to go out immediately, shift to next lower blower.

(f) Opening of intercooler flaps should not be necessary at any flight condition if the engine is operating normally. The intercooler flaps produce considerable drag when open. There should be no hesitation, however, in using the flaps when needed. Until the carburetor air temperature warning light is installed, watch head temperature gage. A rapid increase in head temperature, otherwise unexplained, is a warning of excessive carburetor air temperature.

(10) IGNITION SWITCH.-The ignition switch is mounted to the left of the main instrument panel. The switch has the following positions: OFF - LEFT - RIGHT - BOTH.

(11) STARTING CONTROLS.

(a) The starter switch is located on the electrical distribution panel adjacent to the primer switch. The cartridge starter is a Type III unit. The cartridge breech is located on the starboard side of the engine mount structure and is accessible from outside the airplane through a hinged door locked by quick turn fasteners. Use Type "D" cartridge for starting under normal conditions. However, Type "E" may be used in cold weather or under other conditions where Type "D" is inadequate. A container is attached to the inside of this door for spare cartridges.



(b) The primer switch is located on top of the electrical panel adjacent to the starter switch. The battery switch must be ON to prime and start the engine.

NOTE

The ignition booster is energized only while the starter switch is held ON. It is therefore necessary to hold this switch in the ON position until the engine is turning over under its own power to take full advantage of the ignition booster facilities provided. This switch is of the trip free circuit breaker type. It will trip itself if an overload condition exists. It may therefore be held on without inviting annoying circumstances previously encountered on airplanes equipped with fuse protection.

Figure 22
Shutter Controls
F6F-3 only

Figure 22a
Intercooler Shutter Control - F6F-5

(12) INTERCOOLER & OIL COOLER SHUTTERS CONTROL.-Two position hydraulic valve control knob located on the left hand shelf.

NOTE

On the F6F-5 airplane there are separate controls for each unit.

LEVER AFT - SHUTTERS CLOSED

LEVER FORWARD - SHUTTERS OPEN

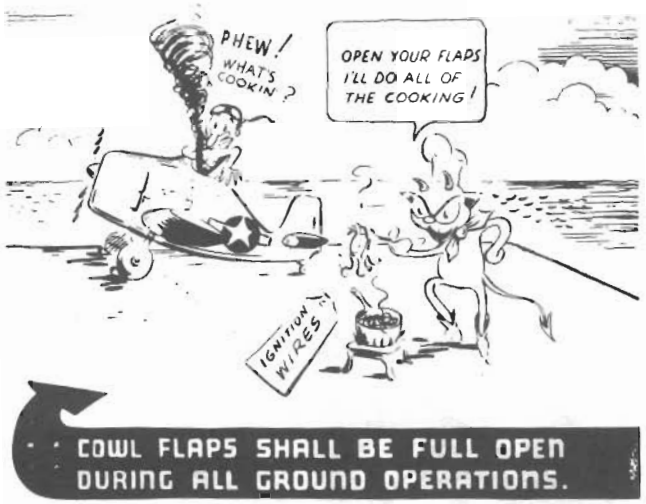
(13) COWL FLAPS CONTROL.-The spring loaded three position cowl flap hydraulic control lever is located on the left hand shelf.

LEVER FORWARD - FLAPS OPEN

LEVER CENTER - NEUTRAL

LEVER AFT - FLAPS CLOSED

The cowl flaps, intercooler and oil cooler shutters can be operated by the hydraulic hand pump in conjunction with the hand pump selector valve when the engine driven hydraulic pump is not operating. (See Hydraulic System.)



c. ACCESSORY EQUIPMENT CONTROLS.

(1) COCKPIT FRESH AIR CONTROL.-The flow of fresh air into the cockpit is governed by a manual control located on the lower center control panel. To operate, turn control to desired position. To close - apply foot to upper side and push. To open - apply foot to lower side and push.

(2) COCKPIT HEATER.-The cockpit heater switch is located on the lower center control panel. If the heater fails to operate, push the circuit breaker on the electrical distribution panel.

NOTE

The cockpit heater switch for the F6F-3N, -5 and -5N is located on the electrical panel.

(3) WINDSHIELD DEFROSTER.-A lever, located on the lower center control panel, directs the flow of warm air to the windshield. With the lever at the top position, the air is directed to defroster only; in the center position, defroster and feet; and in the bottom position, feet only.

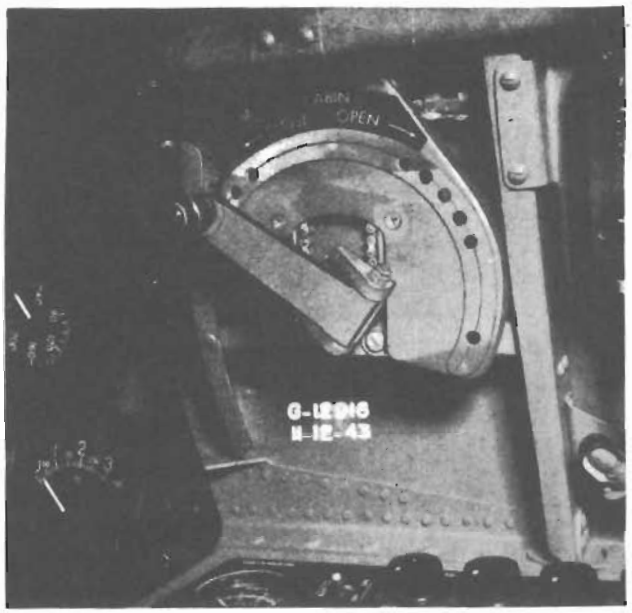


Figure 23 - Cockpit Sliding Hood Control

(4) COCKPIT ENCLOSURE CONTROL.

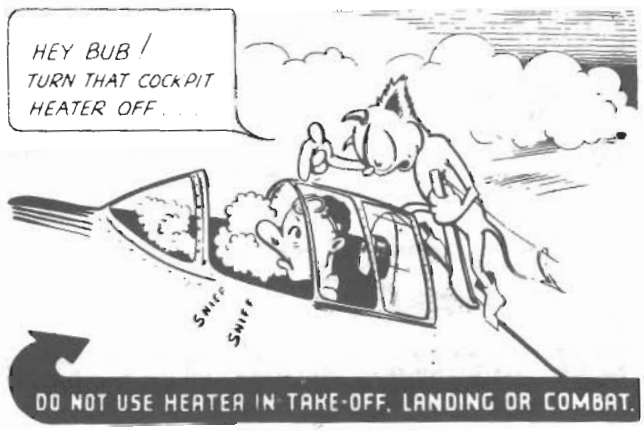
(a) OPERATION.

1. The handcrank is located on the right hand side of the cockpit. Handcrank pin holes are provided for locking the enclosure in any number of open positions or in the fully closed position. When the pin is in one of the holes, the enclosure is locked in the corresponding position. Pulling the control handle inboard unlocks the enclosure and permits the handcrank to be turned in the desired direction to open or close the hood.

ROTATE COUNTER-CLOCKWISE - TO CLOSE

ROTATE CLOCKWISE - TO OPEN

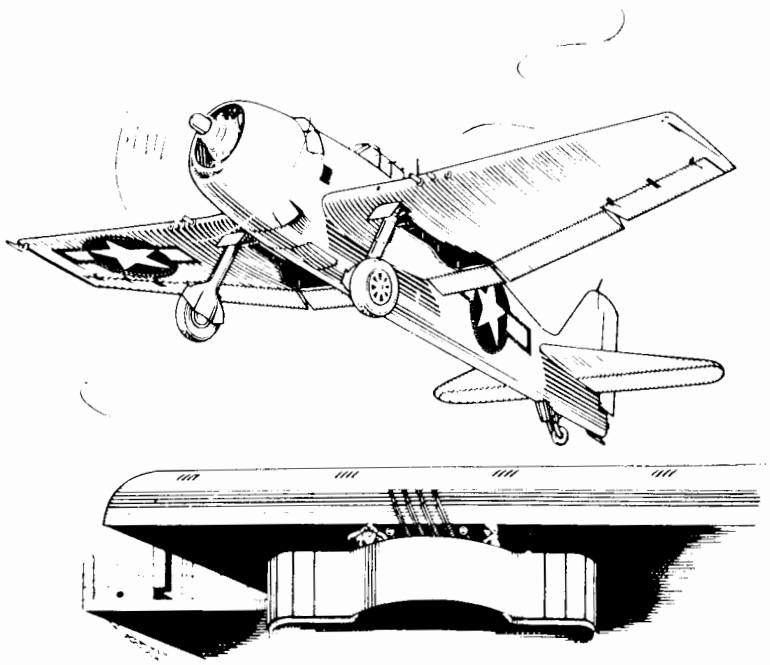
From fully open to fully closed, or vice versa, the handcrank rotates approximately 4-1/2 revolutions.

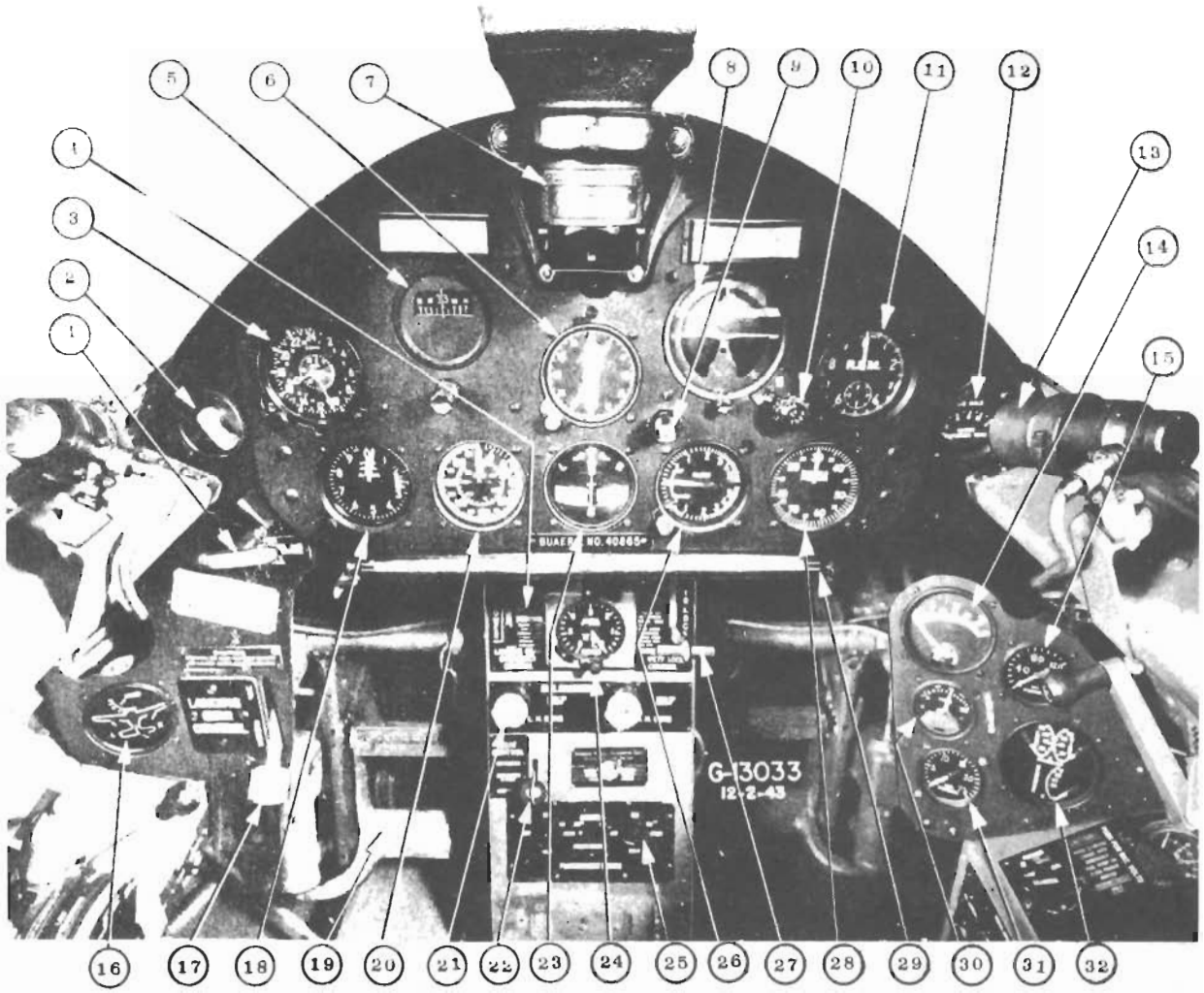


2. On the ground, the enclosure can be opened and closed, and locked or unlocked from outside the cockpit. The push button is located on the right hand cockpit exterior. To operate - push control knob INBOARD and slide hood to desired position.

(b) EMERGENCY RELEASE.-The enclosure is equipped with quick release latches, consisting of release pins with red painted finger rings attached, at the forward end of the track.

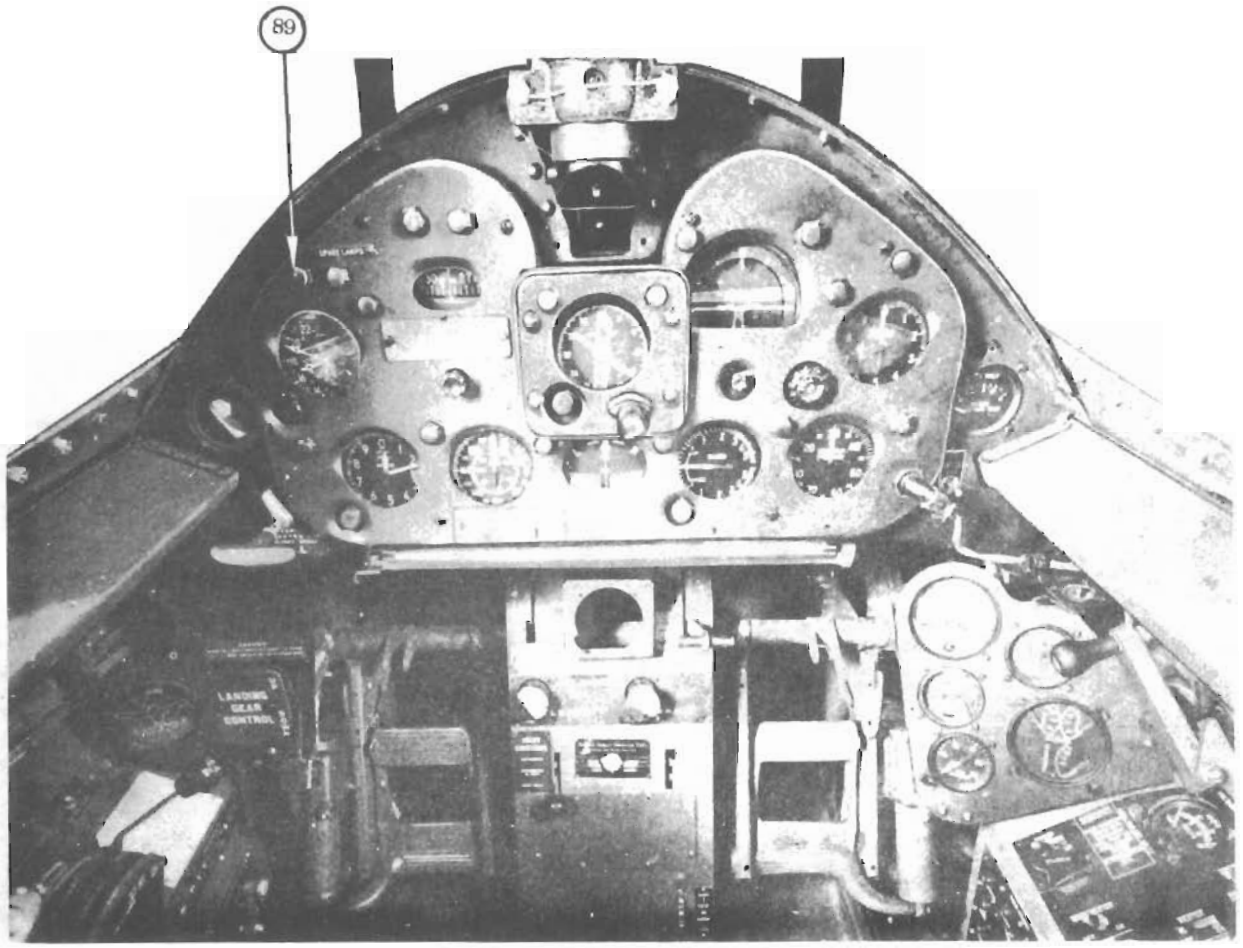
To release, grasp the rings to pull out the pins and push the enclosure up into the airstream which will carry it away.





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. Electric Gun Sight
8. Artificial Horizon Indicator
9. Chartboard Light
10. 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. Sliding Chartboard
30. Oil-In Temperature Gage
31. Fuel Pressure Gage
32. Fuel Quantity Gages

Figure 24 - Cockpit - F6F-3 - Forward View

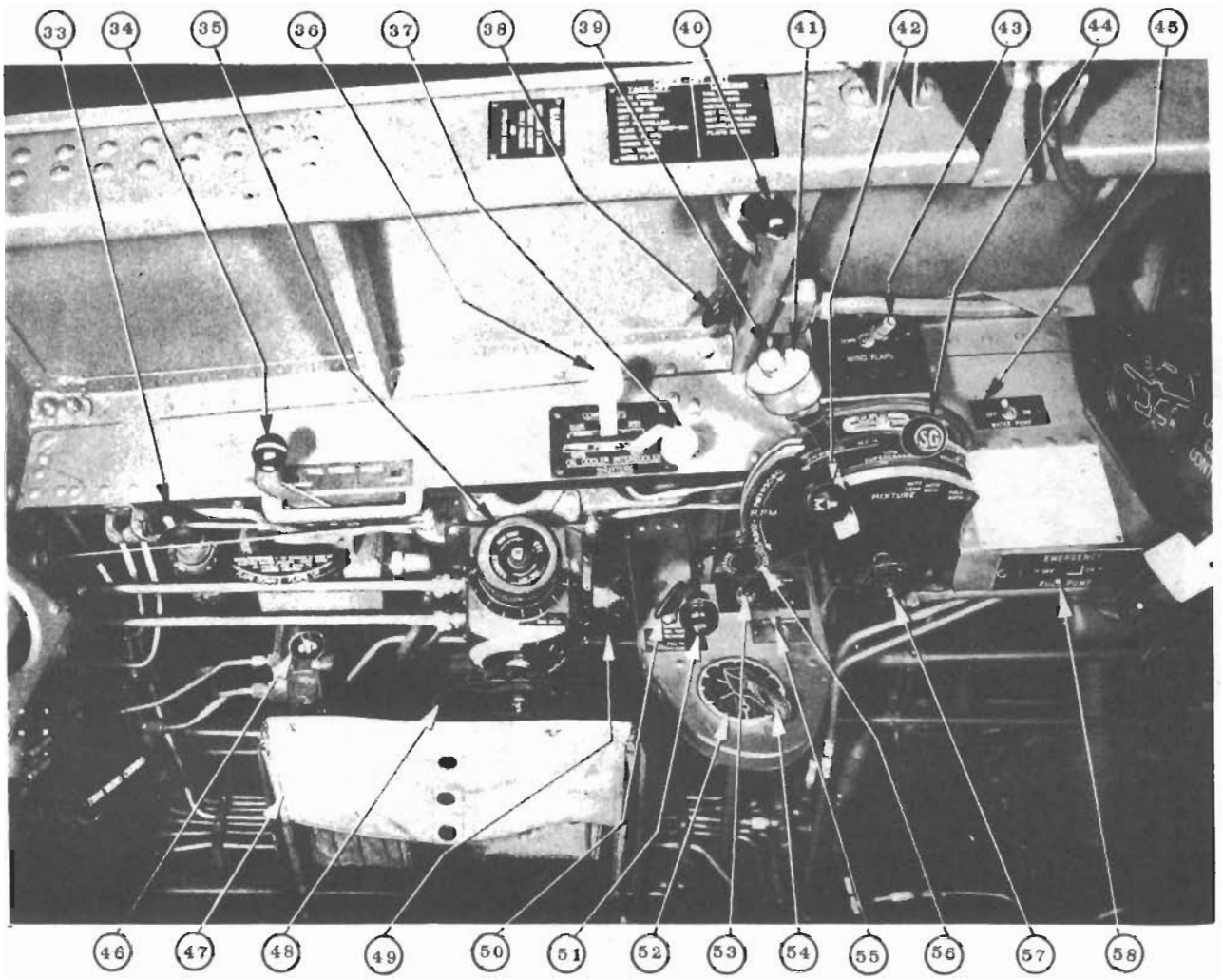


The F6F-5 differs from the F6F-3 in the following respects:

89. Spare Lamps

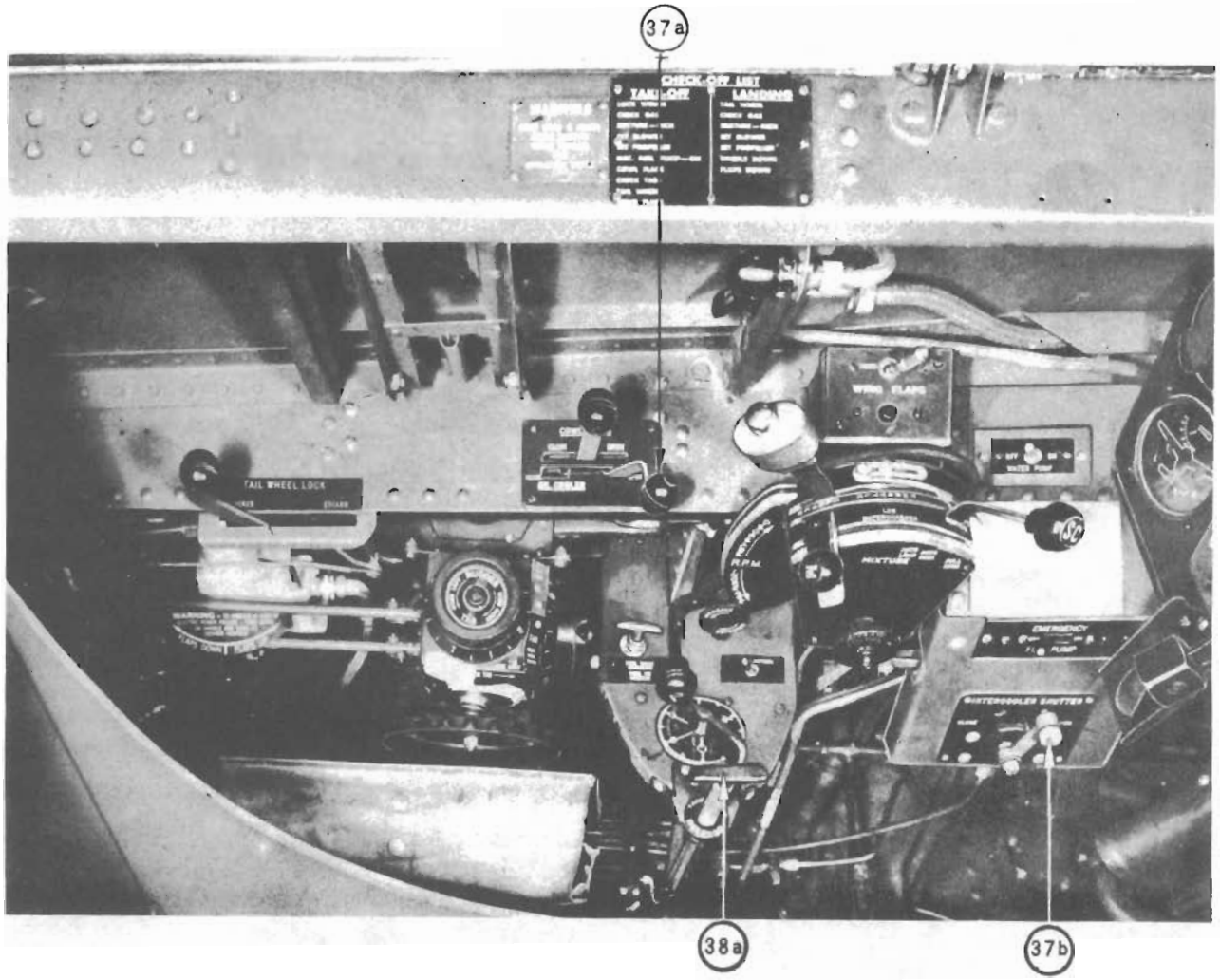
Removal of Flucrescent Lights & Control
Removal of Cockpit Heat Control Switch
to Main Electrical Distribution Panel

Figure 25 - Cockpit - F6F-5 - Forward View



33. Lower Left Cockpit Light
34. Tail Wheel Lock Control
35. Rudder Trim Tab Control
36. Cowl Flaps Control
37. Oil Cooler-Intercooler Shutters Control
38. Droppable Fuel Tank Release Switch
39. Mask Microphone Switch
40. Upper Left Cockpit Light
41. Throttle Control
42. Mixture Control
43. Wing Flap Electrical Switch
44. Supercharger Control
45. A.D.I. Pump Control Switch
46. Wing Flap Manual Control
47. Map Case
48. Elevator Trim Tab Control
49. Aileron Trim Tab Control
50. Fuel Tank Pressurizing Control
51. Propeller Pitch Control
52. Fuel Selector Valve Dialface
53. Reserve Fuel Tank Warning Light
54. Fuel Tank Selector Valve
55. Oil Dilution Switch
56. Propeller Pitch Vernier Control
57. Engine Control Quadrant Friction Knob
58. Auxiliary Electric Fuel Pump Switch

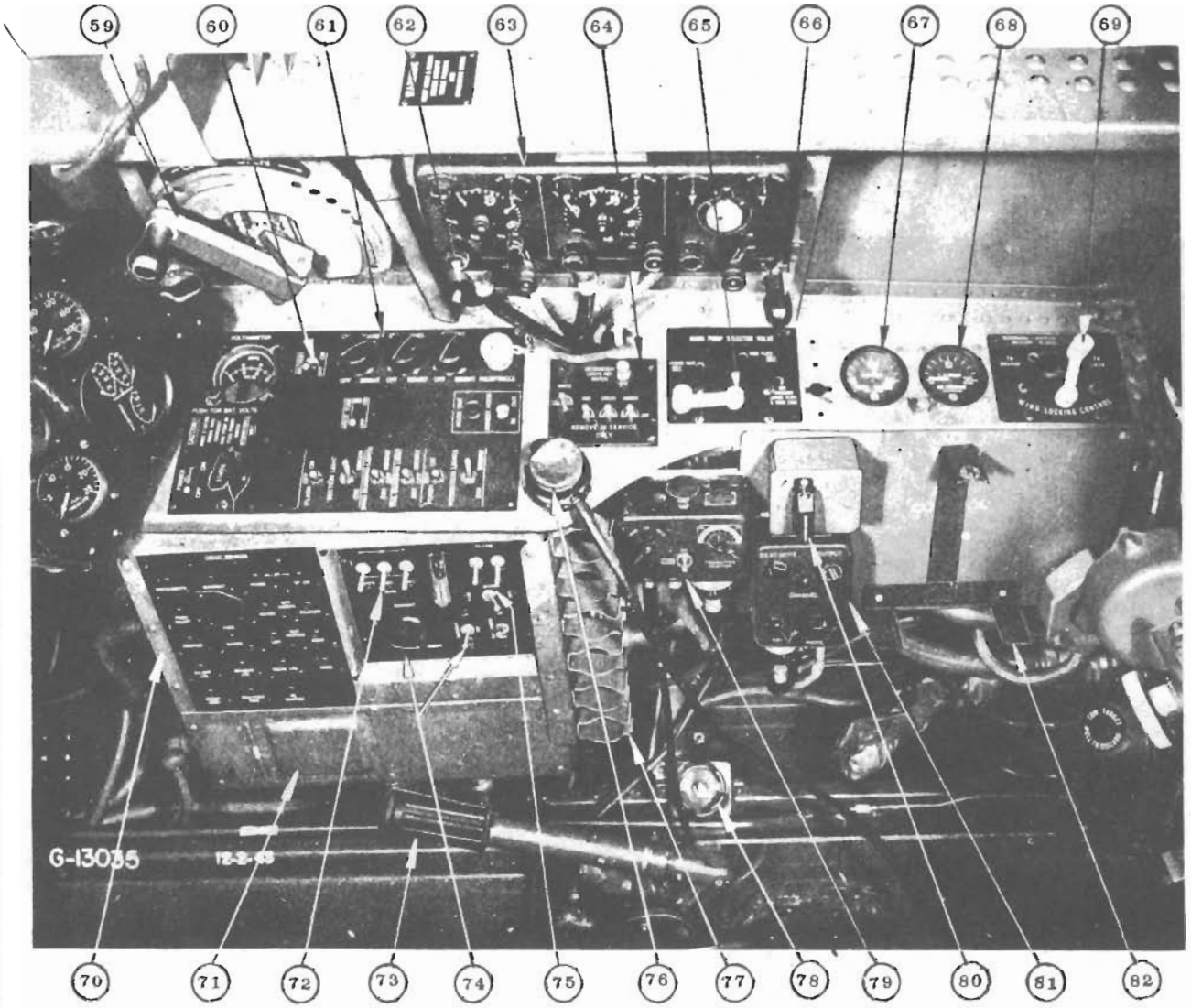
Figure 26 - Cockpit - F6F-3 - Left Side



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

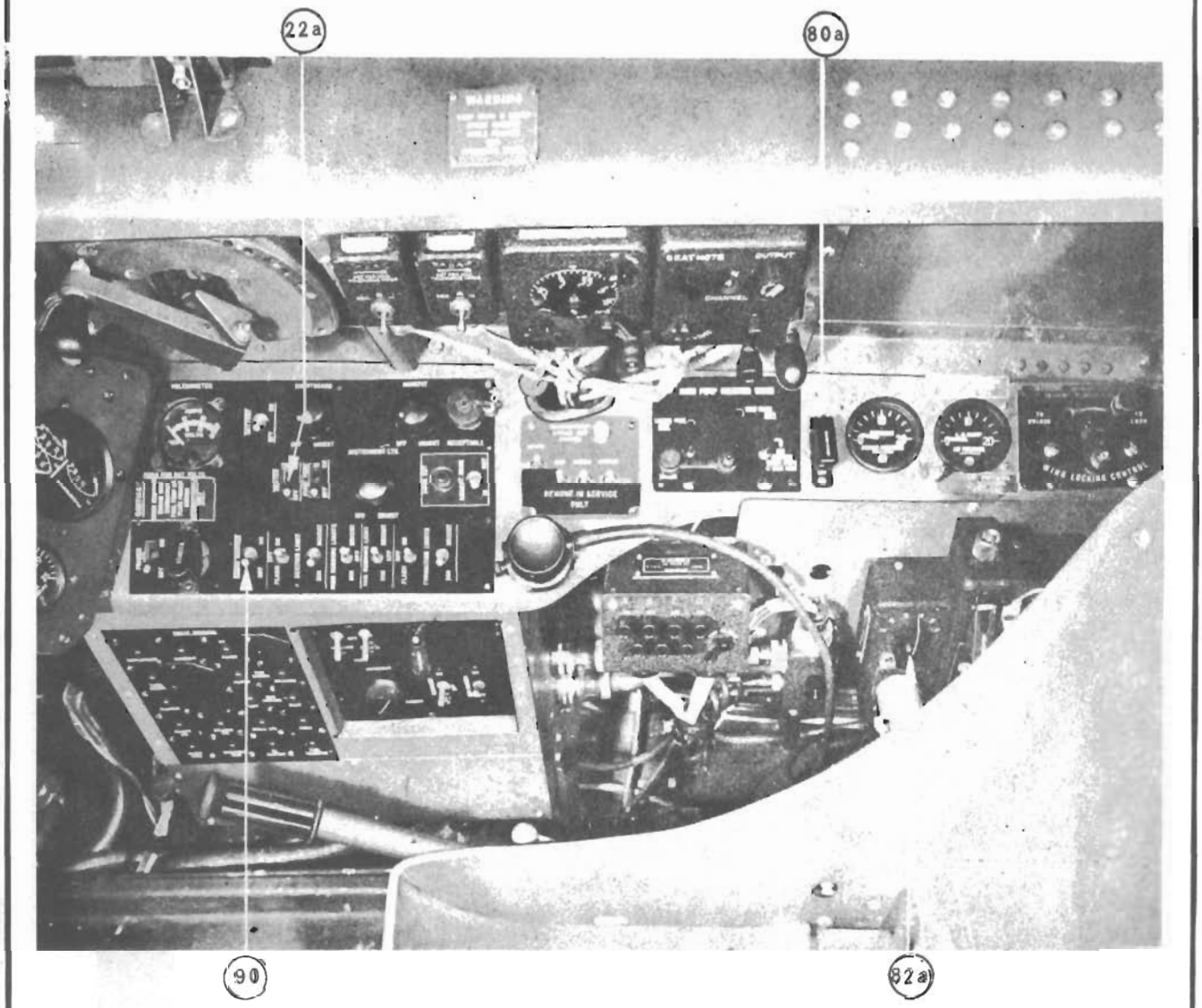
37a. Oil Cooler Shutter Control
37b. Intercooler Shutter Control
38a. Manual Release Control, Droppable Fuel Tank

Figure 27 - Cockpit - F6F-5 - Left Side



59. Cabin Sliding Hood Control
60. Battery Switch
61. Main Electrical Distribution Panel
62. Electrical Panel Light
63. Radio Controls
64. Recognition Lights
65. Hand Pump Selector Valve
66. Aft Right Cockpit Shelf Light
67. Hydraulic System Pressure Gage
68. Landing Gear Emergency Dump Pressure Gage
69. Wing Locking Hydraulic Control
70. Manual Reset Circuit Breaker Panel
71. Access to Reverse Current Relay
72. Machine Gun Switches
73. Hydraulic Hand Pump
74. Gunsight Rheostat and Switch
75. Bomb Control Switches
76. Hand Microphone
77. Pyrotechnic Cartridge Clips
78. Pyrotechnic Pistol Retainer
79. Radio Controls
80. Radio Destruction Switch
81. Microphone Jacks
82. IFF Equipment Support

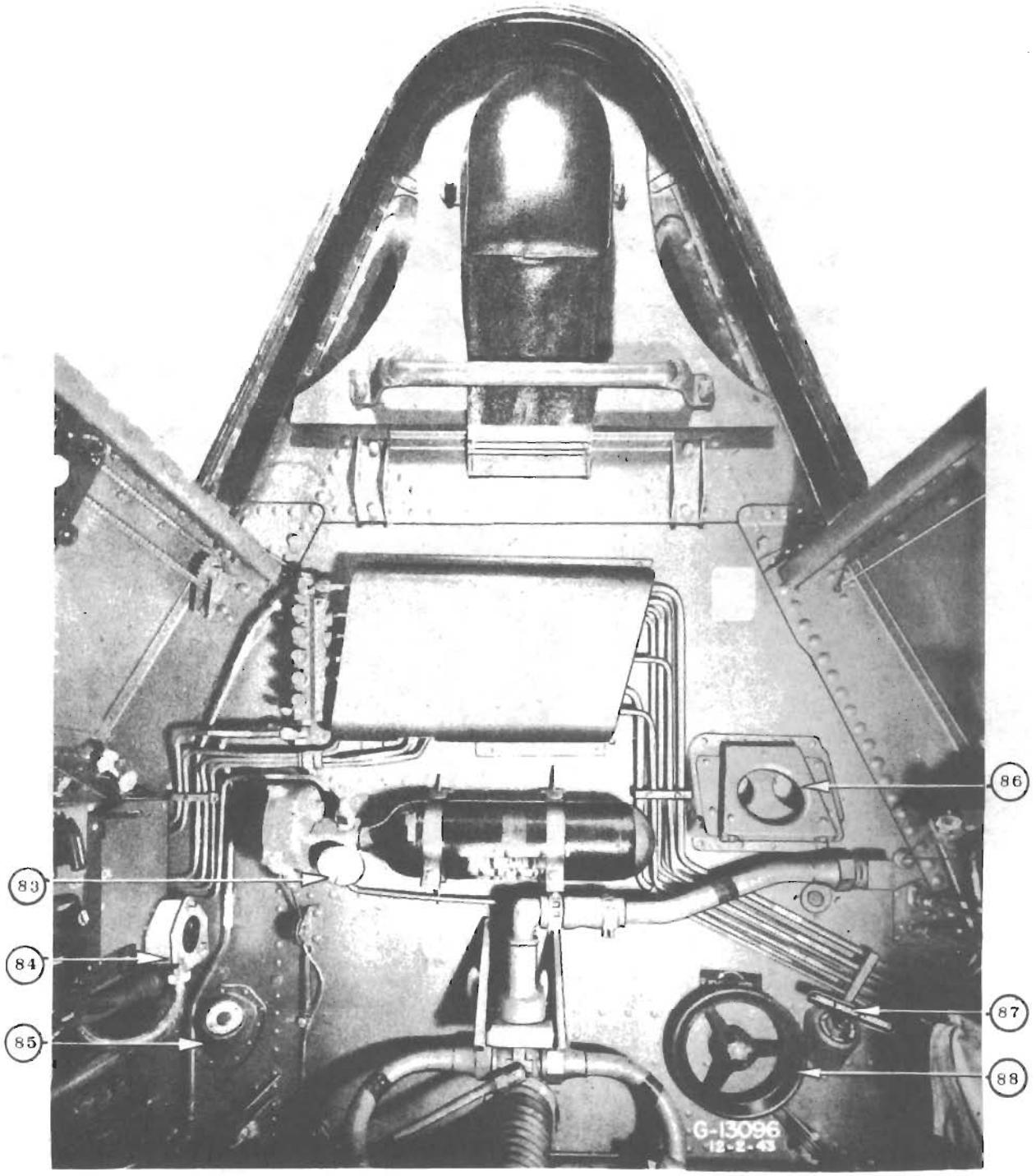
Figure 28 - Cockpit - F6F-3 - Right Side



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

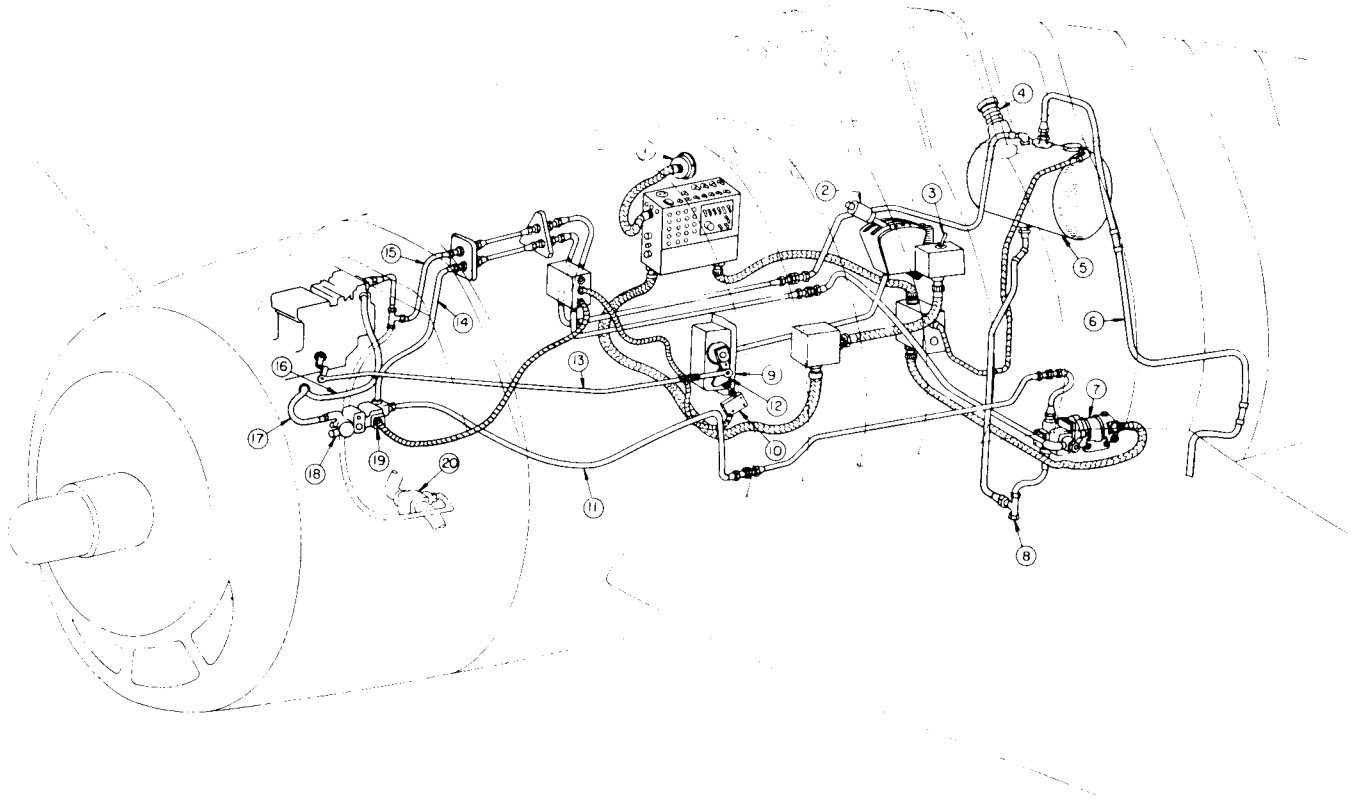
22a. Cockpit Heater Switch
80a. Radio Destruction Switch
82a. IFF Equipment
90. Radio Master Switch

Figure 29 - Cockpit - F6F-5 - Right Side



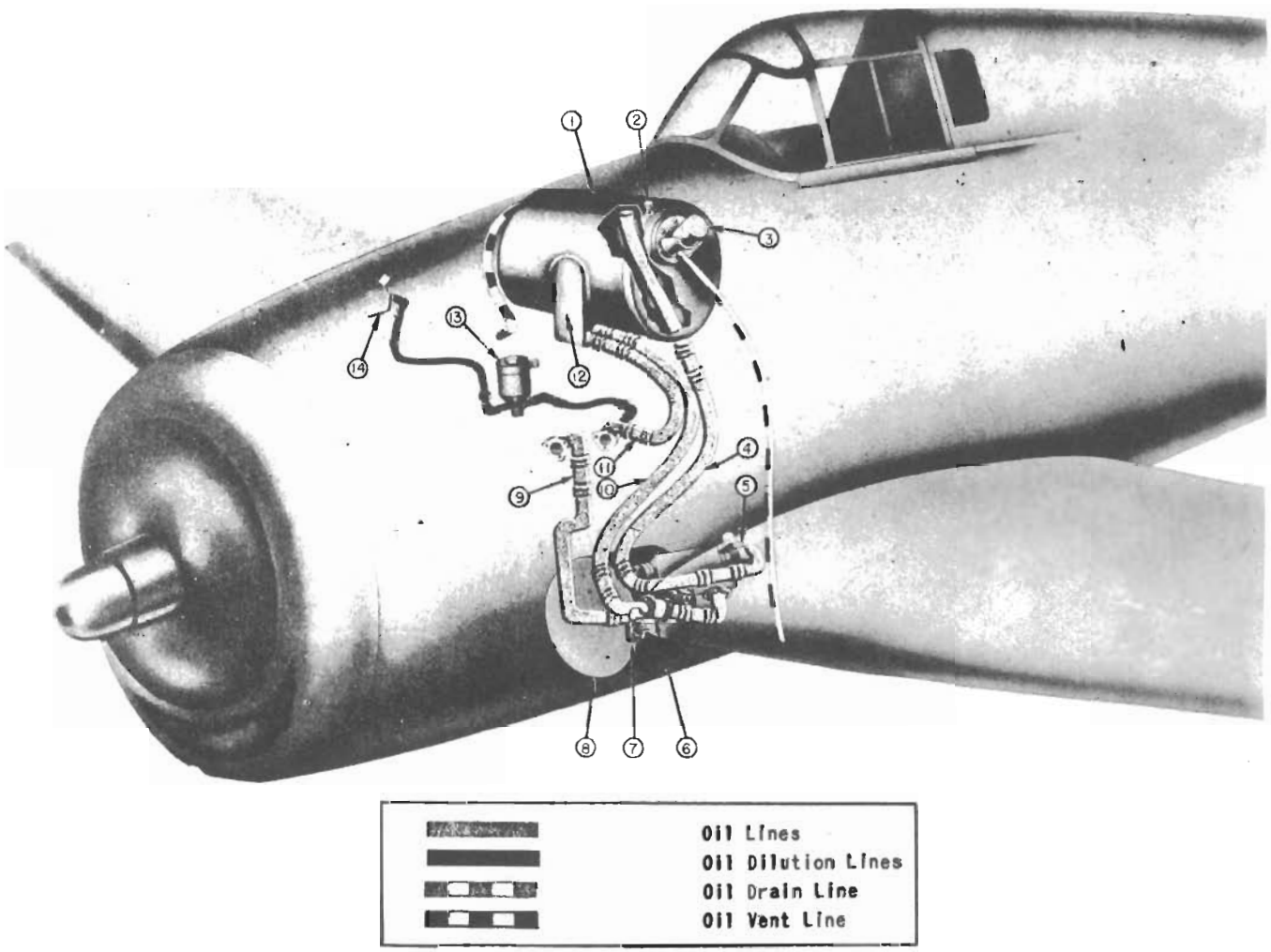
83. L.G. Emergency Dump Air Pressure Test Valve
84. IFF Receptacle
85. Tow Target Release Control
86. Oxygen Regulator Support
87. Arresting Hook Emergency Control Handle
88. Oxygen Tank Supply Valve Control

Figure 30 - Cockpit - Rear View



1. Water Quantity Gage
2. Throttle Control Handle
3. Water Pump Switch
4. Water Tank Filler Neck
5. Water Tank
6. Tank Vent Line
7. Water Pump
8. Water Drain
9. Engine Control Box
10. Micro Switch
11. Water Line
12. Solenoid Valve Actuator Tab
13. Throttle Rod
14. Vapor Vent Line
15. Water Pressure Equalizer Line
16. Fuel Line to Fuel Spinner Nozzle
17. Water Line to Fuel Spinner Nozzle
18. Water Regulator
19. Solenoid Valve
20. Engine Driven Fuel Pump

Figure 31 - Anti-Detonant Injection System Diagram



1. Oil Tank
2. Sounding Rod
3. Filler Cap
4. Oil Return to Top of Tank
5. Oil Diverter Valve
6. Oil Flow Check Valve
7. Oil Tank Drain Valve
8. Oil Cooler
9. Engine Oil-Out Line
10. Oil Return to Warm-Up Compartment
11. Engine Oil-In Line
12. Warm-Up Compartment
13. Oil Dilution Solenoid Valve
14. Carburetor Y Fitting

Figure 32 - Oil System Diagram

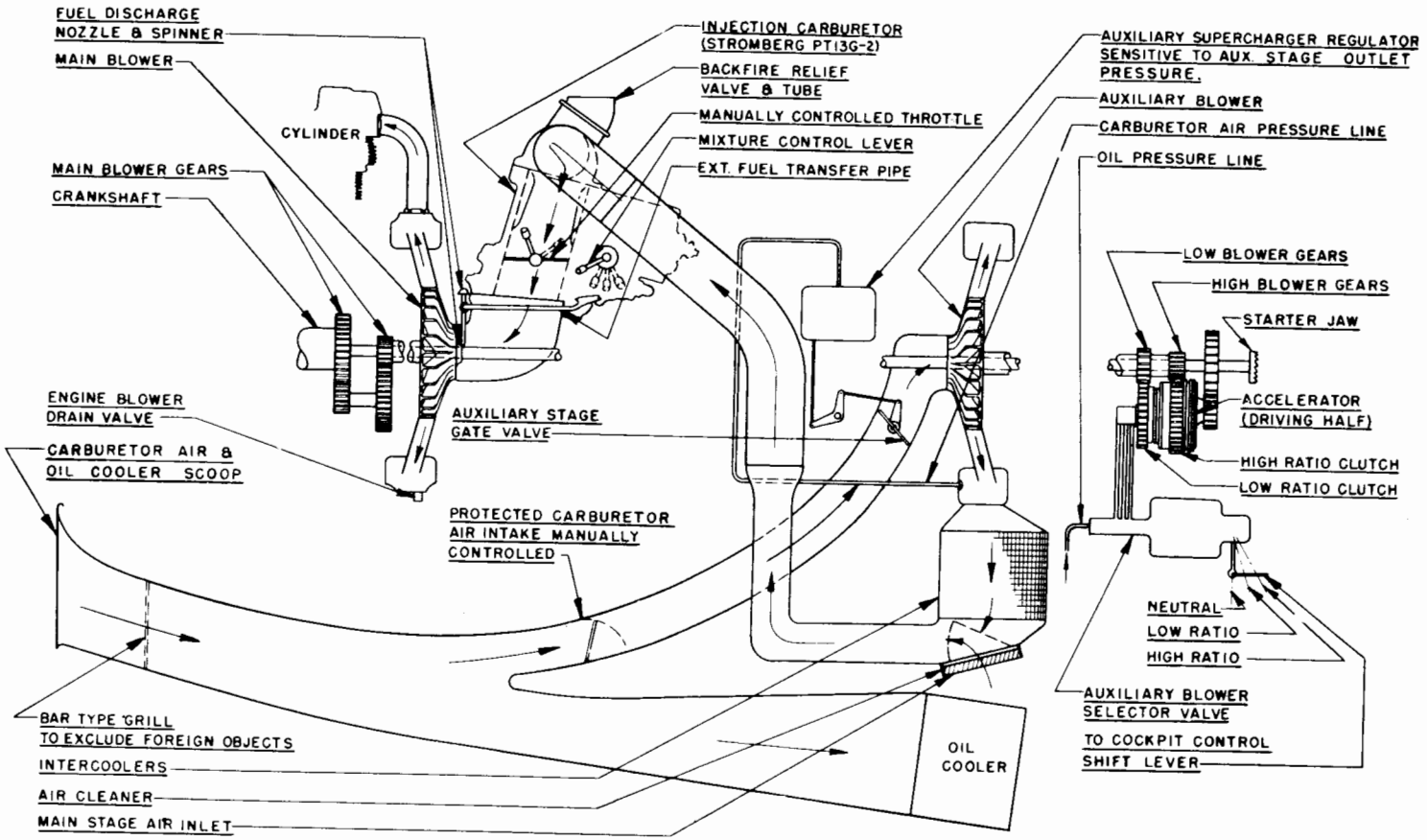


Figure 33 - Carburetor Induction System Diagram

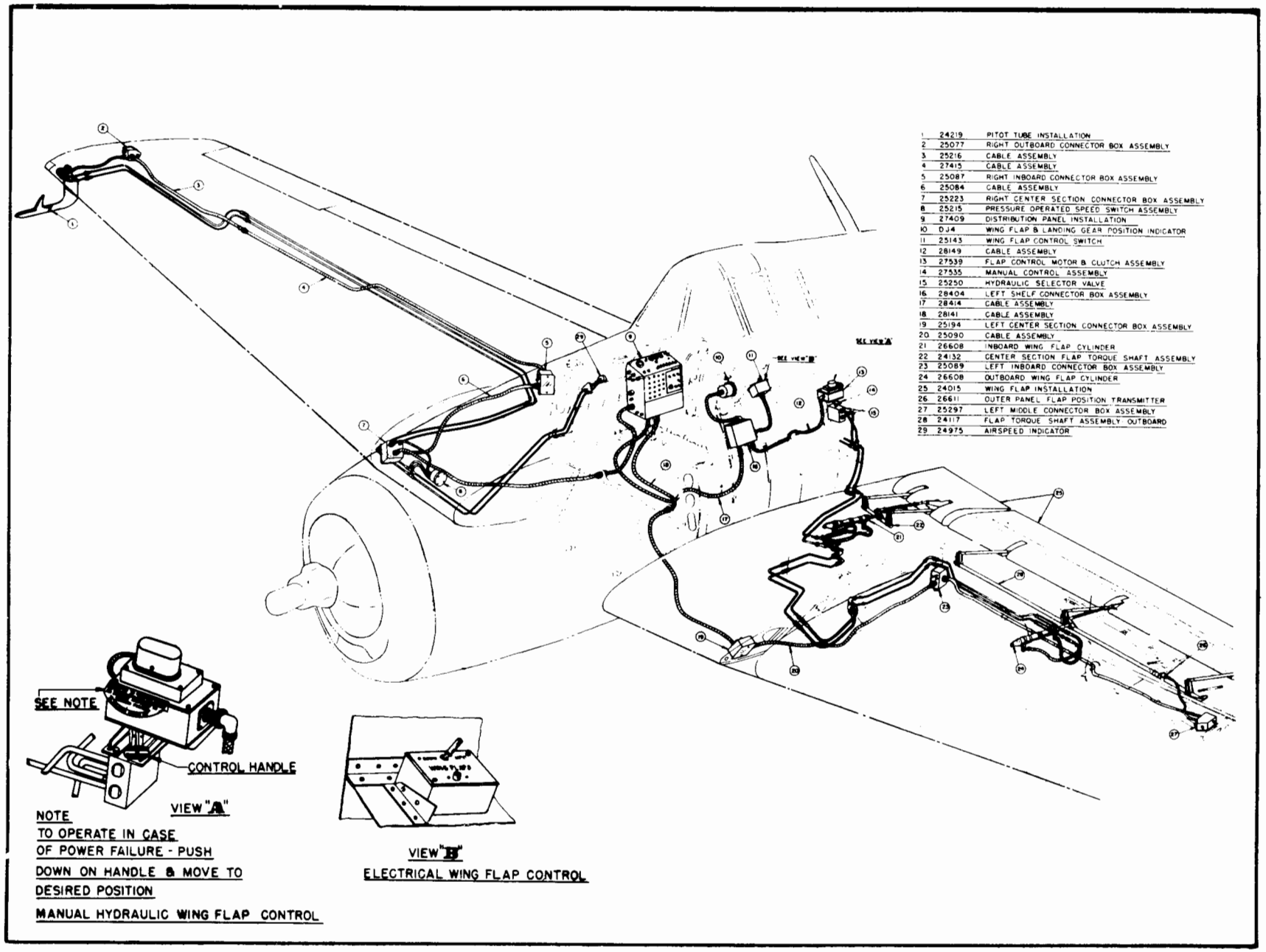
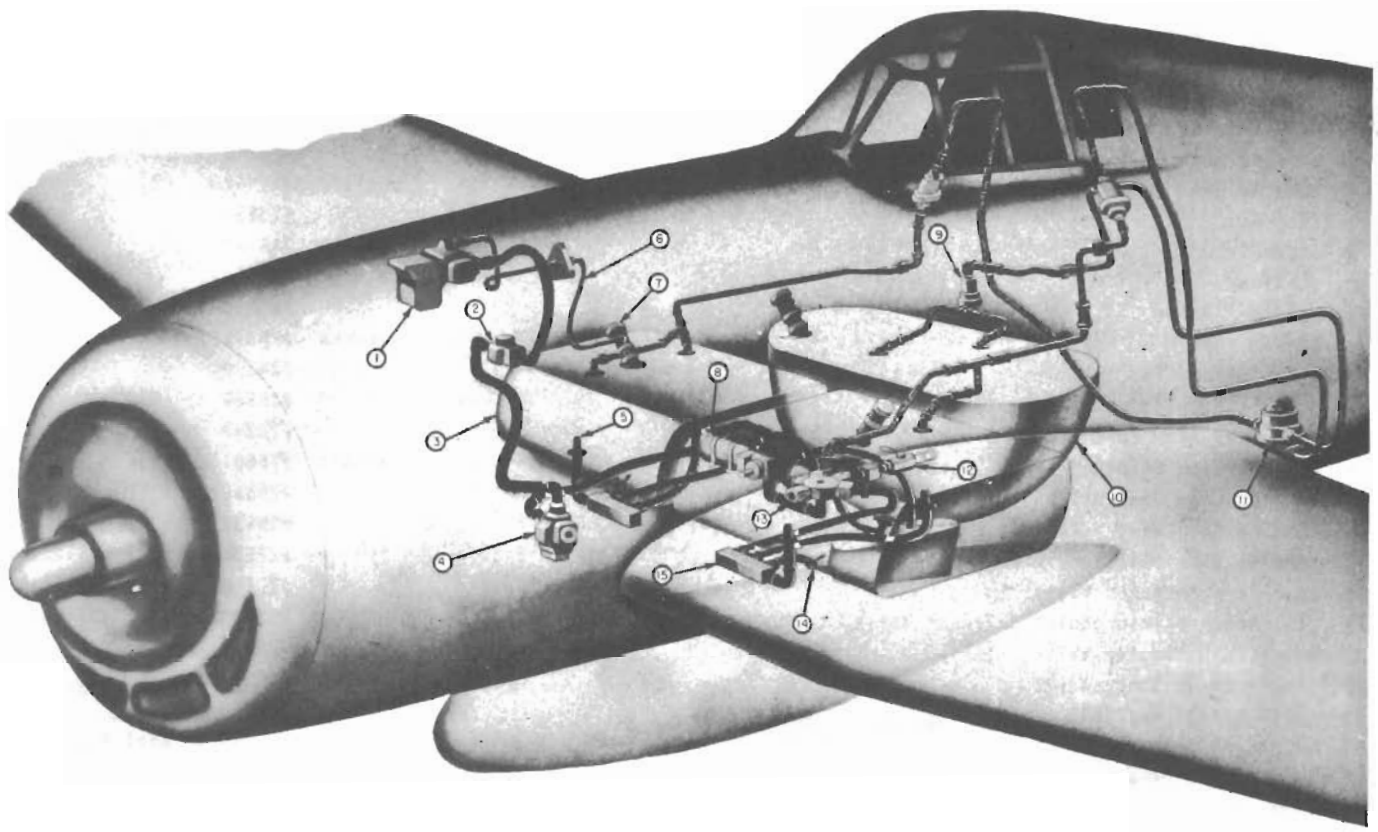


Figure 34 - Wing Flap Control System Diagram



Fuel Lines
Vent Lines

1. Carburetor
2. Engine Driven Fuel Pump
3. Right Main Fuel Tank
4. Fuel System Filter
5. Fuel Tank Outlet Strainer (5)
6. Carburetor Vapor Vent Line
7. Fuel Tank Filler Neck (3)
8. Auxiliary Electric Fuel Pump
9. Catapult Check Valve (3)
10. Reserve Fuel Tank
11. Fuel Tank Pressurizer Unit
12. Reserve Tank Drain Valve
13. Fuel Tank Selector Valve
14. Main Fuel Tank Drain Valve (2)
15. Fuel Tank Junction Block

Figure 35 - Fuel System Diagram

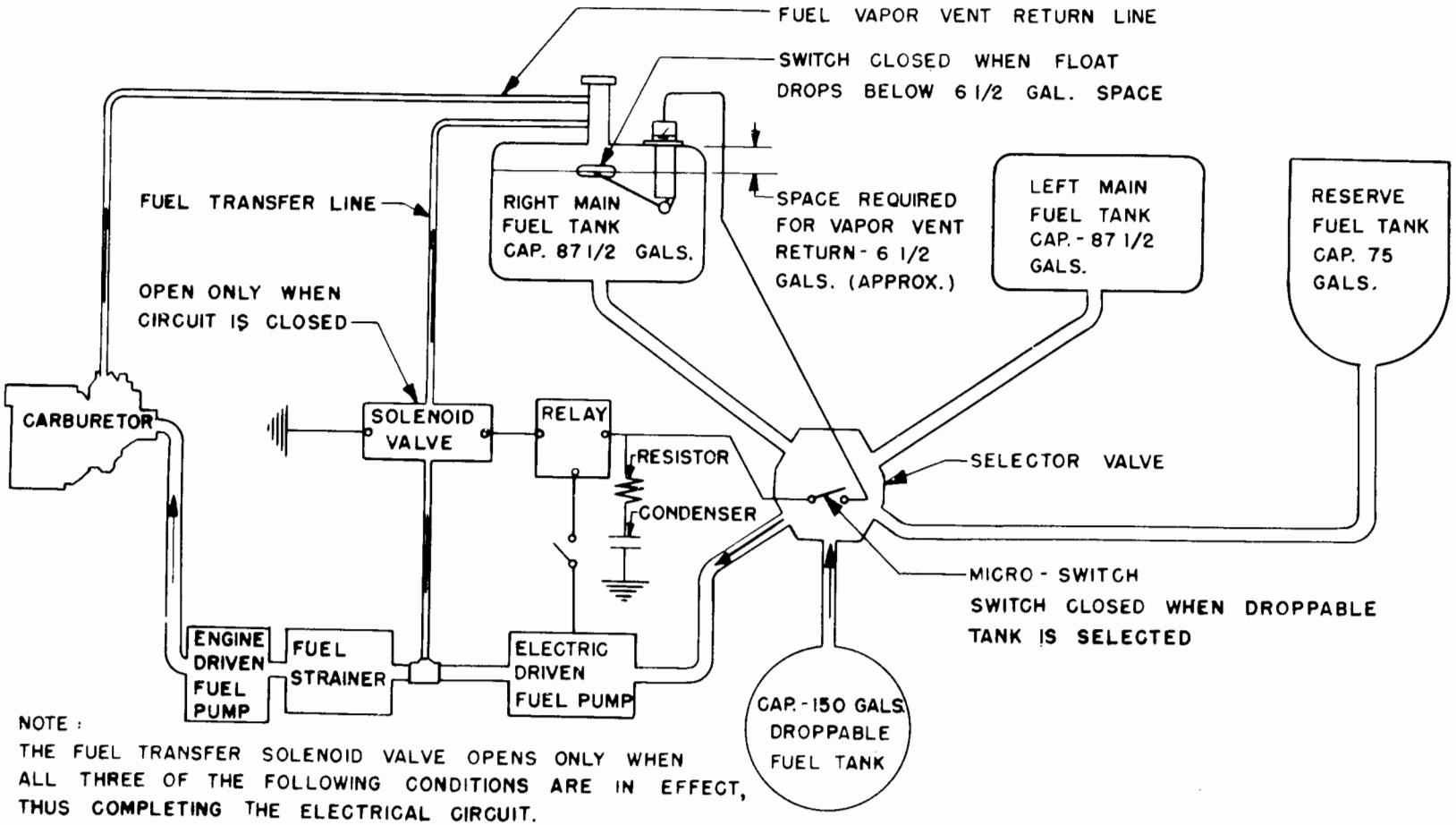
1	Wing Flap Cylinder		#26608	(4)
2	Wing Flap Flow Restrictors		#25247	(8)
3	Gun Charger Cylinder	Bendix	#76862	(6)
4	Wing Lock Cylinder		#25258	(2)
5	Wing Folding Timer Check Valve		#26639-1	(2)
6	Landing Gear Cylinder		#25248	(2)
7	Landing Gear Cylinder Control Head	Kidde	#P-4028	(2)
8	Reservoir		#25234	
9	Accumulator	Vickers	#AA-14007B	
10	Strainer	Purolator	#G159J-10	
11	Unloader Valve		#25250	
12	Engine Pump	Vickers	#PF9-2713-10ZE	
13	Intercooler Flap Cylinder		#26390	
14	Cowl Flap Cylinder		#26390	(3)
15	Cowl Flap Flow Restrictors		#25247	(2)
16	Gun Charging Selector Valve	Bendix	#76861	(2)
17	Landing Gear Dump Valve		#26639-2	
18	Landing Gear Vent Valve		#26639-1	
19	Landing Gear Selector Valve		#27596 or Adel #D11223	
20	Cowl Flap Selector Valve		#25250 or Adel #D11401	
21	Oil Cooler & Intercooler Selector Valve		#25250 or Adel #D11401	
22	Wing Flap Selector Valve		#25250	
23	Landing Gear Emergency Dump Air Bottle	Kidde	#80577	
24	Check Relief Manifold		#27500	
25	Wing Lock Selector Valve		#25250 or Adel #D11401	
26	Dump Bottle Pressure Gauge U.S.		#2052	
27	Dump Bottle Inflation Valve		#28826	
28	System Pressure Gauge		#2052	
29	Hand Pump Selector Valve		#25249 or Adel #D11224	
30	Hand Pump	Electrol	#190 or Adel #D11182	
31	Oil Cooler Flap Cylinder		#26390	
32	Tail Wheel Cylinder		#25283	
33	Main Relief Valve	Electrol	#191 or Adel #D10292	

NOTE:

1. Hydraulic Fluid Spec. AN-VV-O-366 (Red Color-Mineral Oil)
2. Reservoir Total Capacity 2.2 Gals.
3. Reservoir & System Total Capacity 4.0 Gals. (Approx.)

NOTE

The F6F-3 airplanes (Buro. Aero. #39999 and subsequent are not equipped with the lower cowl flaps.)



NOTE :
THE FUEL TRANSFER SOLENOID VALVE OPENS ONLY WHEN ALL THREE OF THE FOLLOWING CONDITIONS ARE IN EFFECT, THUS COMPLETING THE ELECTRICAL CIRCUIT.

1. DROPPABLE FUEL TANK IS SELECTED.
2. FUEL LEVEL IN RIGHT MAIN FUEL TANK DROPS BELOW 81 GALS.
3. AUXILIARY FUEL PUMP IN OPERATION.

ANY DEVIATION FROM THESE CONDITIONS AUTOMATICALLY BREAKS THE ELECTRICAL CIRCUIT, CLOSES THE SOLENOID VALVE & STOPS THE FUEL TRANSFER SYSTEM FROM FUNCTIONING.

Figure 37 - Fuel Transfer [illegible]em - Schematic Diagram

SECTION II

PILOT OPERATING INSTRUCTIONS

NOTE

The flight limitations and restrictions of this section are subject to change and the latest service instructions and applicable technical orders must be consulted.

1. BEFORE ENTERING COCKPIT OF AIRPLANE.

AIRPLANE LOADING.-The pilot shall obtain the initial gross weight and loading condition of the airplane before entering the cockpit for flight.

2. ON ENTERING THE COCKPIT.

a. ALL FLIGHTS.

(1) Adjust seat, shoulder harness, rudder pedals and rear view mirror.

(2) Landing gear control - "DOWN".

(3) Check oxygen supply and regulator.

(4) Check to see that the controls are as follows:

(a) Mixture - "IDLE CUT-OFF".

(b) Propeller - Increase RPM.

(c) Blower - "NEUTRAL".

(5) Check operation of auxiliary fuel pump.

(6) Check Landing Gear and Flap position indicator.

(7) Check fuel tank quantities.

(8) Check gun sight illumination and armament controls.

(9) Check radio controls.

(10) Cowl Flaps "OPEN".

b. SPECIAL CHECK FOR NIGHT FLYING.

(1) Test operate all cockpit lights.

(2) Test operate recognition, formation and section lights.

(3) Test operate gun sight illumination.

(4) Test operate approach light.

(5) Test operate landing light. (Night Fighters)

3. PREPARATION FOR STARTING.

With the ignition switch OFF and the mixture control in IDLE CUT-OFF, rotate the engine four or five revolutions by hand in the normal direction to insure that the combustion chambers are clear of oil and fuel. If the engine has stood idle for one hour or more, it may be necessary to remove a spark plug from each of the lower cylinders so that accumulated oil may be expelled.

CAUTION

Strict adherence to this procedure is necessary to preclude liquid lock and possible resulting damage to articulating rods. Never turn the engine backwards to clear it.

4. STARTING ENGINE.

a. After referring to preparation for starting, proceed as follows:

(1) Set throttle approx. 1/5 open. Throttle should be retarded to limit RPM to not over 800 until oil pressure shows after starting.

(2) Mixture - "IDLE CUT-OFF".

(3) Supercharger - "NEUTRAL".

(4) Battery switch "ON".

(5) Auxiliary fuel pump "ON".

(6) Hold primer switch on for three to five seconds. **(Less, if engine is warm).**

(7) Ignition switch "ON BOTH".

(8) Starter switch "ON". When engine fires advance mixture control to "AUTO RICH".

(9) Do not exceed 1000 RPM until oil temperature reaches at least 40°C.

NOTE

If the oil pressure gage does not indicate **40 p.s.i.** within 30 seconds, the engine should be stopped and an investigation made.

WARNING

If engine stops, return the mixture control to IDLE CUT-OFF immediately and return the auxiliary fuel pump switch to OFF.

NOTE

The ignition booster is energized only while the starter switch is held ON. It is therefore necessary to hold this switch in the ON position until the engine is turning over under its own power to take full advantage of the ignition booster facilities provided. This switch is of the trip free circuit breaker type. It will trip itself if an overload condition exists. It may therefore be held on without inviting annoying circumstances previously encountered on airplanes equipped with fuse protection. Intermittent use of the primer may also be necessary until the engine picks up speed.

CAUTION

Overpriming or excessive priming prior to turning the engine over, may result in drainage of sufficient gasoline into the lower cylinders to cause bending or failure of an articulating rod. Excessive priming has a tendency to wash oil off the cylinder walls. Scoring or seizing of the pistons and cylinder barrels may be caused by this condition.

Rusting of the piston rings and cylinder walls will occur if the engine is allowed to stand for a day or more after unsuccessful attempts to start, unless surfaces are protected by a fresh application of oil.

5. EMERGENCY TAKE-OFF.

An emergency take-off may be made providing the oil temperature is at least 40°C; oil pressure is steady; and the engine will take the throttle without spitting or missing. Head temperature should be brought up to 120°C before take-off whenever possible. Avoid rapid throttle movement.

6. ENGINE WARM-UP.

Warm-up at approximately 1000 RPM with propeller in high RPM (low pitch), cowl flaps full open.

NOTE

In cold weather, if excessive oil pressures are obtained when the speed is INCREASED hold to 800 RPM until the oil pressure drops below 100 p.s.i. To prevent damage to the oil pressure gage, avoid high oil pressure when engine is still cold by holding down RPM.

7. GROUND TEST.

a. When the oil temperature has reached **40°C,** open the throttle to get approximately 1500 RPM with the propeller in full low pitch (control lever full down). Then move propeller control lever through its full range several times, pausing in the extreme positions until RPM stabilizes. A consistant change of RPM should result when the control is shifted from one extreme position to the other, if the propeller governor is operating satisfactorily.

b. Make idle mixture check with throttle set for 600 rpm and auxiliary fuel pump "ON". Move the mixture control lever smoothly and steadily into the "IDLE CUT-OFF" position and observe the tachometer for any change in rpm. Return the mixture control lever to the "AUTO-RICH" position before the engine cuts.out. A rise of more than 10 rpm indicates too rich an idle mixture, and no change or a drop in rpm indicates that the mixture is too lean. A rise of 5 to 10 rpm is recommended in order to permit idling at low speeds without danger of fouling plugs and at the same time to afford good acceleration characteristics.

c. With propeller in full low pitch (control full down) set throttle for 1200-1400 RPM. Shift rapidly from NEUTRAL to LOW blower, wait **15** seconds, and shift from LOW to HIGH blower. Watch for slight changes of oil pressure and RPM as the shifts are made. Such changes indicate satisfactory operation of the engaging mechanisms. No variation of manifold pressure should occur (unless the field is well above sea level) if the auxiliary stage regulator is operating properly.

d. Open the throttle to approximately 30" Hg. manifold pressure which should give 2000-2200 RPM in low pitch. Then check the functioning of the magnetos by putting ignition switch on "LEFT". The

normal drop-off in RPM is 50 to 75 and does not usually exceed 100 RPM. Return switch to both until RPM stabilizes then turn to "RIGHT" and note RPM drop-off. **Do not operate longer than 15 seconds on single magneto. This check should be made in as short a time as practicable.**

e. Check generator out-put. (28.0 volts).

8. TAXIING INSTRUCTIONS.

a. The tail wheel shall be unlocked when taxiing.

b. A steady run of the engine is preferable to repeated short bursts of power.

c. Cowl flaps shall be full open.

WARNING

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

9. TAKE-OFF.

a. Spread and lock wings.

b. Rev up engine to clear it.

c. Cowl flaps 1/2 "OPEN".

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

e. Propeller control "FULL INCREASE" RPM position.

f. Mixture control "AUTO-RICH".

g. Supercharger control "NEUTRAL".

h. Fuel selector valve "RIGHT MAIN".

i. Carburetor protected air control "FULL IN".

j. Fuel pressure 16 to 18.5 p.s.i.

k. Manifold pressure **54.0 Hg. (Maximum)**

l. Tail wheel "LOCKED" for land operations and "UNLOCKED" for carrier.

m. Cockpit enclosure "OPEN".

n. Cockpit heater switch "OFF".

o. Auxiliary fuel pump "ON".

p. Wing Flaps "AS REQUIRED".

q. Rudder tab - two marks "NOSE RIGHT" - aileron and elevator tabs "NEUTRAL".

10. IMMEDIATE ACTION AFTER TAKE-OFF.

a. Raise landing gear as soon as airplane is airborne.

b. Ease back to required manifold pressure for best climb (52.5 inches Hg. maximum), 130 Knots best speed.

c. Retrim as necessary.

d. Check all cockpit instruments.

e. Turn auxiliary fuel pump off when safe altitude is reached.

11. ENGINE FAILURE DURING TAKE-OFF.

If engine fails during take-off, act as follows:

a. Immediately depress nose in order to maintain flying speed.

b. Make sure the landing gear control is in "UP" position, if landing gear did not have time to retract it will collapse upon landing.

c. If time:

(1) Wing flaps as required.

(2) Put fuel selector valve in "OFF" position.

(3) Throw battery switch "OFF".

(4) Open cabin hood.

(5) Ignition switch "OFF".

(6) Land straight ahead.

12. HIGH POWER CLIMB.

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

b. Cowl flaps "1/3 OPEN"

c. Do not exceed 260°C cylinder head temperature.

d. Sea level to 7000 ft.

(1) "NEUTRAL" blower.

(2) 2700 RPM.

(3) Use 52.5" manifold pressure (but not more), below full throttle.

(4) Hold IAS constant at 130 Knots.

e. 7000 to 22,000 ft.

(1) "LOW" blower.

(2) 2550 RPM.

(3) Use 49.5" manifold pressure (but not more) below full throttle.

(4) Hold IAS constant at 130 Knots.

f. 22,000 ft. UP.

(1) "HIGH" blower.

(2) 2550 RPM.

(3) Use 49.5" manifold pressure (but not more) below full throttle.

(4) Hold IAS constant at 130 Knots.

The IAS may vary five Knots over or under

130 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.

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, and the resulting loss in rate of climb will be small.

13. CRUISING CLIMB.

a. Mixture control "AUTO LEAN".

b. Cowl flaps "CLOSED".

c. Do not exceed 232°C cylinder head temperature.

d. Sea level to 12,000 ft.

(1) "NEUTRAL" blower.

(2) 2250 RPM.

(3) Use 34" manifold pressure (but not more) below full throttle.

(4) Maintain 145 Knots IAS with clean fighter.

(5) Maintain 140 Knots IAS with overload fighter (with drop tank).

e. 12,000 to 25,000 ft.

(1) "LOW" blower.

(2) 2100 RPM.

(3) Use 34" manifold pressure (but not more) below full throttle.

(4) Maintain 145 IAS with clean fighter.

(5) Maintain 140 Knots IAS with overload fighter (with drop tank).

f. 25,000 ft. UP.

(1) "HIGH" blower.

(2) 2050 RPM.

(3) Use 34" manifold pressure (but not more) below full throttle.

(4) Maintain 135 Knots IAS (with both clean and overload fighters).

No opening of 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.

14. LEVEL FLIGHT.

a. Use the RPM-Manifold pressure combinations shown on the Specific Engine Flight Chart, Figure 39. Maintain the specified manifold pressure (but not more) below full throttle. Instructions for military power in HIGH blower, are omitted, because a higher airspeed is obtained at normal rated power (because of loss in propeller efficiency at military RPM and high altitude)

b. If intermediate power settings between maximum cruising and normal rated are desired, refer to the Engine Calibration Curves (Figures 45, 46, and 47) and select the chart corresponding to the blower ratio in which you intend to operate. Pick any RPM-Manifold pressure combination shown on the full throttle line, or to your right from the full throttle line, and set your throttle and propeller control accordingly. Your altitude does not need to be considered if you are near or below the altitude shown on the chart for the point which you have picked. (If your altitude is much higher than the altitude shown on the chart, you will not be able to get the desired manifold pressure, but will end up with full throttle and a somewhat lower manifold pressure.) Use the lowest blower ratio that will give you sufficient power for the IAS desired.

c. 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 in the Specific Engine Flight Chart, Figure 39. For lower powers, observe the following rule:

(1) RULE FOR CRUISING.-Maintain 34" manifold pressure (but not more) or full throttle, if above critical altitude. Control IAS by adjusting RPM. Do not exceed 2250 RPM in NEUTRAL blower, 2150 RPM in LOW blower, or 2050 RPM in HIGH blower. 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" Hg. and minimum RPM is too high, reduce manifold pressure as necessary. Otherwise, do not use less than 34" below critical altitude. Use AUTO LEAN at all times unless shift to AUTO RICH is necessary to control head temperatures. Do not exceed 232°C cylinder head temperature. Do not open cowl flaps, or oil

cooler and intercooler flaps, unless temperatures approach limits.

(2) RULE FOR OBTAINING MAXIMUM RANGE.-

Observe Rule for Cruising, and maintain 135 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 5 Knots for each 10 Knots of headwind until IAS reaches 150 Knots. Do not exceed 150 Knots IAS, regardless of wind force. Do not compensate for tailwinds.)

(3) 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.

15. RULE FOR DESCENT.

When descent is made along intended course, maintain 150 to 160 Knots IAS at 1300 RPM and 15" to 18" manifold pressure.

16. RULE FOR DIVING.

Before retarding throttle to enter dive, shift to NEUTRAL blower regardless of your altitude. Set propeller control for 2050 to 2250 RPM, and adjust throttle for 15" to 20" manifold pressure. During the dive, do not allow manifold pressure to build up over 34" before retarding throttle. The maximum allowable diving RPM is 3060 for not more than 30 seconds.

NOTE

Before retarding throttle to enter a steep and extended dive, it is desirable to shift to AUTO RICH in order to avoid backfiring which may otherwise result from lag of the automatic mixture control during rapid loss of altitude.

17. WAR EMERGENCY POWER.

a. 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.

b. 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:

1. Water pressure shuts off a fuel jet in the carburetor, "deriching" the mixture to approximately best-power.
2. Water pressure resets the auxiliary stage supercharger regulator for approximately 3.5" Hg. higher carburetor inlet pressure.
3. Water is metered and mixed with the fuel.

c. Before using WEP check the water quantity gage on the extreme right hand side of the main instrument panel to be sure that the tank has been serviced. 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.

d. With the power controls set for military power (See Chart, Fig. 39), 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", 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.

NOTE

When a carburetor air temperature warning light has been installed, the light may be expected to flash ON during WEP operation. This should cause no concern. Before or after WEP operation, however, the light will not be ON unless the carburetor air temperature is too high for safe operation.

CAUTION

Continuous operation at WEP should not exceed five minutes.

e. 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.

f. 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. Then check water pump switch and water quantity gage. If the pump switch is ON, and the gage shows water available, the difficulty is probably due to low water pressure. This malfunction cannot be corrected while in flight.

g. 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.

Methods of checking the auxiliary stage supercharger regulator setting and water (anti-detonant) pressure are described in separate technical instructions.

18. GENERAL FLYING CHARACTERISTICS.

a. STABILITY. - The airplane is stable at all normal loadings.

(1) Lowering of the landing gear tends to make the airplane slightly nose-heavy.

(2) Lowering of the wing flaps tends to make the airplane nose-heavy.

b. STALLING.

(1) 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 as follows:

CLEAN - POWER ON - 62 Knots

CLEAN - POWER OFF - 64 Knots

L.G. & FLAPS DOWN - POWER ON - 50 Knots

L.G. & FLAPS DOWN - POWER OFF - 53 Knots

c. SPIN CHARACTERISTICS.-With the airplane loaded to 11250 pounds with C.G. position at 26.00%, spins of four turns were investigated. A normal entry was made with ailerons 1/2 against the spin.

(1) 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) RECOVERY.

(a) After 4-1/4 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 1-1/2 turns and level flight attained.

(c) Loss of altitude 5000 feet.

(3) LEFT SPIN.

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

(b) Aileron forces are heavier.

(c) Nose oscillations - greater amplitude.

(4) RECOVERY.

(a) After 4 turns recovery was effected in 1-3/4 turns.

(b) Aileron and elevator forces about double of those in right spin, rudder forces about same.

(c) Loss of altitude 4400 feet.

d. GLIDING.-The best gliding speed of this airplane can be learned best by experiences as it will vary depending on loading conditions.

e. SIDESLIPPING.-This airplane can be sideslipped or skidded.

CAUTION

F6F-3: Airspeed indicator reading - 15-20 Knots HIGH during a LEFT wing forward skid.
F6F-5: Airspeed indicator reading - 10 Knots LOW during a RIGHT wing forward skid.

f. DIVING.-The maximum permissible diving speed below 15000 feet is 391 Knots IAS. The engine RPM shall not exceed 3060 and manifold pressure shall not exceed 34 inches Hg. Before entering dive:

(1) Adjust trim.

(2) Cabin hood FULLY CLOSED.

(3) Cowl Flaps CLOSED.

(4) Intercooler and oil cooler shutters CLOSED.

(5) Supercharger control NEUTRAL.

(6) Propeller control 2050-2250 RPM.

(7) See Paragraph 16 - RULE FOR DIVING.

WARNING

Never dive with supercharger control in either LOW or HIGH position.

2. ACROBATICS.-The acrobatic qualities of this airplane are excellent. All normal acrobatics are permissible. However, inverted flying must be limited to three seconds, due to the inability of the oil scavenger pump to operate in the inverted position.

19. APPROACH AND LANDING.

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.

a. Open cabin hood.

b. Fuel selector valve to BEST TANK.

c. Mixture control AUTO RICH.

d. Propeller 2250 to 2450 RPM.

e. Supercharger NEUTRAL.

f. Cowl flaps 1/2 OPEN.

g. Arresting hook extended (carrier operation).

h. Oil cooler and intercooler flaps OPEN (F6F-3). Intercooler flaps CLOSED (F6F-5).

i. Landing gear DOWN.

j. Tail wheel caster - LOCKED for landing operation and UNLOCKED for carrier operation.

k. Safety guns.

l. Lower wing flaps.

20. LANDING.

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. Raise the wing flaps.

b. Unlock tail wheel before taxiing.

c. Cowl flaps FULL OPEN.

d. Oil cooler and intercooler flaps - as required.

NOTE

Open cowl flaps and set propeller control full down (High RPM) as soon as landing is completed.

21. DESLUDGING.

The following desludging procedure shall be followed after each flight when operations permit:

a. Propeller control Low pitch, High RPM.

b. Engine RPM approximately 1200

c. Shift supercharger controls remaining in each position for approximately 30 seconds.

22. STOPPING ENGINE.

a. Propeller control Low pitch, High RPM.

b. Throttle set at approximately 1000 RPM.

c. Put mixture control to IDLE CUT-OFF.

d. Put ignition switch in OFF position after propeller stops rotating.

e. Place fuel selector in OFF position.

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

g. Leave cowl flaps FULL OPEN.

23. OIL DILUTION.

If cold weather (below 30°F) is anticipated at the next engine starting, use the following procedure:

a. Engine speed 1000 RPM.

b. Hold oil dilution switch on for approximately four minutes. (Switch is spring loaded).

c. Move propeller pitch control slowly several times from extreme increase to decrease RPM to fill the propeller dome with diluted oil.

d. During last few seconds of dilution period, move mixture control to IDLE CUT-OFF. Do not release oil dilution switch until engine stops. Turn off ignition and fuel selector after propeller stops rotating.

CAUTION

1. Do not over-dilute.

2. Guard against fire.

3. Dilute only when justified by forecast of temperatures below 30°F (-1°C).

4. Keep oil system free from sludge and water.

e. When the cold engine is subsequently started and if after running a short time, the oil pressure starts to fluctuate or drop, the dilution switch may 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.

When the oil dilution switch is held ON, there will be a sharp drop in fuel pressure. Fuel pressure should return to normal immediately upon releasing the switch. If this does not occur, stop engine immediately and check solenoid valve for leakage.

SECTION III

FLIGHT OPERATING DATA

1. AIRSPEED LIMITATIONS.

a. Do not exceed an indicated airspeed of **415** Knots with the F6F-3 airplane.

b. Do not exceed an indicated airspeed of **430** Knots with the F6F-5 airplane.

I.A.S.	CORRECTION
FLAPS RETRACTED	
100 KNOTS	ADD 12 KNOTS
120 KNOTS	ADD 12 KNOTS
140 KNOTS	ADD 13 KNOTS
160 KNOTS	ADD 13 KNOTS
180 KNOTS	ADD 14 KNOTS
200 KNOTS	ADD 14 KNOTS
220 KNOTS	ADD 15 KNOTS

Figure 38
Airspeed Correction Table - F6F-3

I.A.S.	CORRECTION
FLAPS RETRACTED	
100 KNOTS	SUBTRACT 5 KNOTS
120 KNOTS	SUBTRACT 6.5 KNOTS
140 KNOTS	SUBTRACT 7 KNOTS
160 KNOTS	SUBTRACT 10 KNOTS
180 KNOTS	SUBTRACT 11 KNOTS
200 KNOTS	SUBTRACT 13 KNOTS
220 KNOTS	SUBTRACT 15 KNOTS
240 KNOTS	SUBTRACT 17 KNOTS
FLAPS EXTENDED	
80 KNOTS	ADD 6.5 KNOTS
100 KNOTS	ADD 4.5 KNOTS
120 KNOTS	ADD 2 KNOTS
140 KNOTS	SUBTRACT 1 KNOT
160 KNOTS	SUBTRACT 2 KNOTS

Figure 38a
Airspeed Correction Table - F6F-5

Carburetors: Stromberg PT-13G2
Stromberg PT-13G6

Engine Models: R-2800-10
R-2800-10W

Operating Conditions	Altitude (feet)	Max. Permissible R.P.M.	Max. Permissible Manifold Press. "Hg.	Mixture Control	Blower Ratio	Max. Cyl. Head Temperature (°C)	Permissible Oil in Temp. Gauge (°C)	Oil Pressure Lbs. Per Sq. Inch
Starting		800		Idle Cut-off then Auto-Rich	Neutral			
Warm-Up		1000		Auto-Rich	Neutral low, high	205		
Take-Off *	S.L.	2700	**54.0**	Auto-Rich	Neutral	290	40-85	75-100
Normal Rated Power	S.L.-**7000**	2550	**44.0**	Auto-Lean	Neutral	260	60-85	75-95
Normal Rated Power	**7000**-22000	2550	**49.5**	Auto-Lean	low	260	60-85	75-95
Normal Rated Power	22000 Up	2550	**49.5**	Auto-Lean	High	260	60-85	75-95
Max.Cruising Power	S.L.-13000	2250	**34**	Auto-Lean	Neutral	232	60-85	60-90
Max.Cruising Power	13000-25000	**2400**	**34**	Auto-Lean	Low	232	60-85	60-90
Max.Cruising Power	25000-Up	2050	**34**	Auto-Lean	High	232	60-85	60-90
Military Power **	S.L.-7000	2700	52.5	Auto-Lean	Neutral	260	**40**-100	75-100
Military Power **	7000-22000	2700	53.0	Auto-Lean	Low	260	**40**-100	75-100
Use Normal Rated Power in High Blower	2200-Up	2550	**49.5**	Auto-Lean	High	260	**40**-100	75-100
War Emergency * (Water Injection)	S.L.-3000	2700	60	Auto-Lean	Neutral			55 (min.)
	3000-16000	2700	60	Auto-Lean	Low			55 (min.)
	46000-UP	2700	60	Auto-Lean	High			55 (min.)
Dive		3000	**45-20**	Auto-Lean (1)	Neutral	232	60-85	
Landing		2250-**2450**		Auto-Rich	Neutral	232	60-85	
Stopping		1200		Auto-Rich (Idle) Idle Cut-off (Stop)	Neutral			

* 5 Min. Rating
** 30 Min. Rating

(1) If dive is too steep for automatic mixture control to compensate for rapid change in altitude, it may be necessary to shift to Auto-Rich to avoid backfiring.

Fuel Pressure: Desired - 17 p.s.i.
Allowable - 16-18.5 p.s.i.
Min. Idling - 7 p.s.i.

Figure 39 - Specific Engine Flight Chart

SECTION IV

EMERGENCY OPERATING INSTRUCTIONS

1. FORCED LANDING DUE TO ENGINE FAILURE.

a. In the event of a forced landing, the pilot must decide whether the landing can be made with the wheels down.

b. Landing gear either UP or DOWN depending on terrain.

c. Battery and ignition switches OFF.

d. Fuel selector valve OFF.

e. Cabin Enclosure OPEN.

f. Shoulder harness LOCKED.

g. Adjust seat as LOW as possible.

CAUTION

In the event of a forced landing on water, the landing gear must be UP; the cabin enclosure OPEN; and the shoulder harness LOCKED.

Lower wing flaps if possible and make a nose high landing.

2. ENCLOSURE EMERGENCY RELEASE.

The enclosure is equipped with quick release latches, consisting of release pins with red finger rings attached, at the forward end of the track.

To release, grasp the rings to pull out the pins and push the enclosure up in the airstream which will carry it away.

WARNING

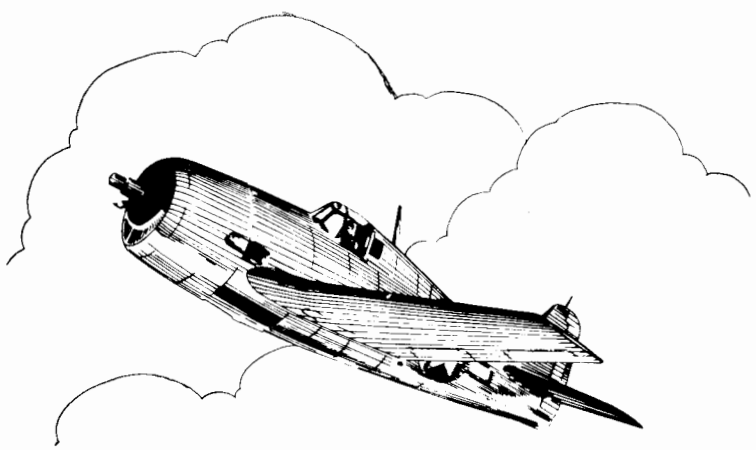
Pull both release rings simultaneously to prevent jamming the enclosure.

3. LANDING GEAR EMERGENCY LOWERING.

In case of complete hydraulic system failure, pull the L.G. Emergency Release "T" handle FULL DOWN and LOCK.

CAUTION

Use this control at or below 90 Knots. If the emergency system is operated at higher airspeeds than it can overcome, the gear will come down part way and trail.



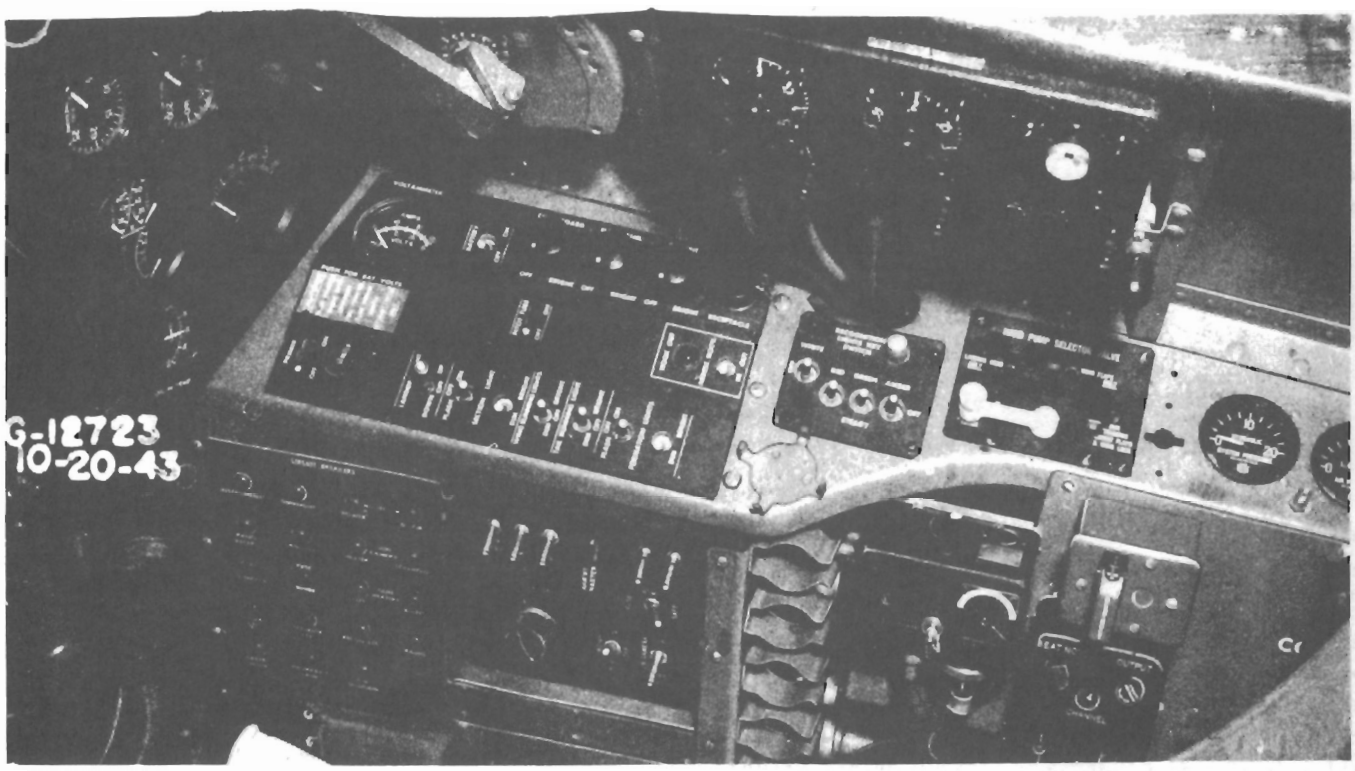


Figure 40 - Radio Controls (Current Airplane)

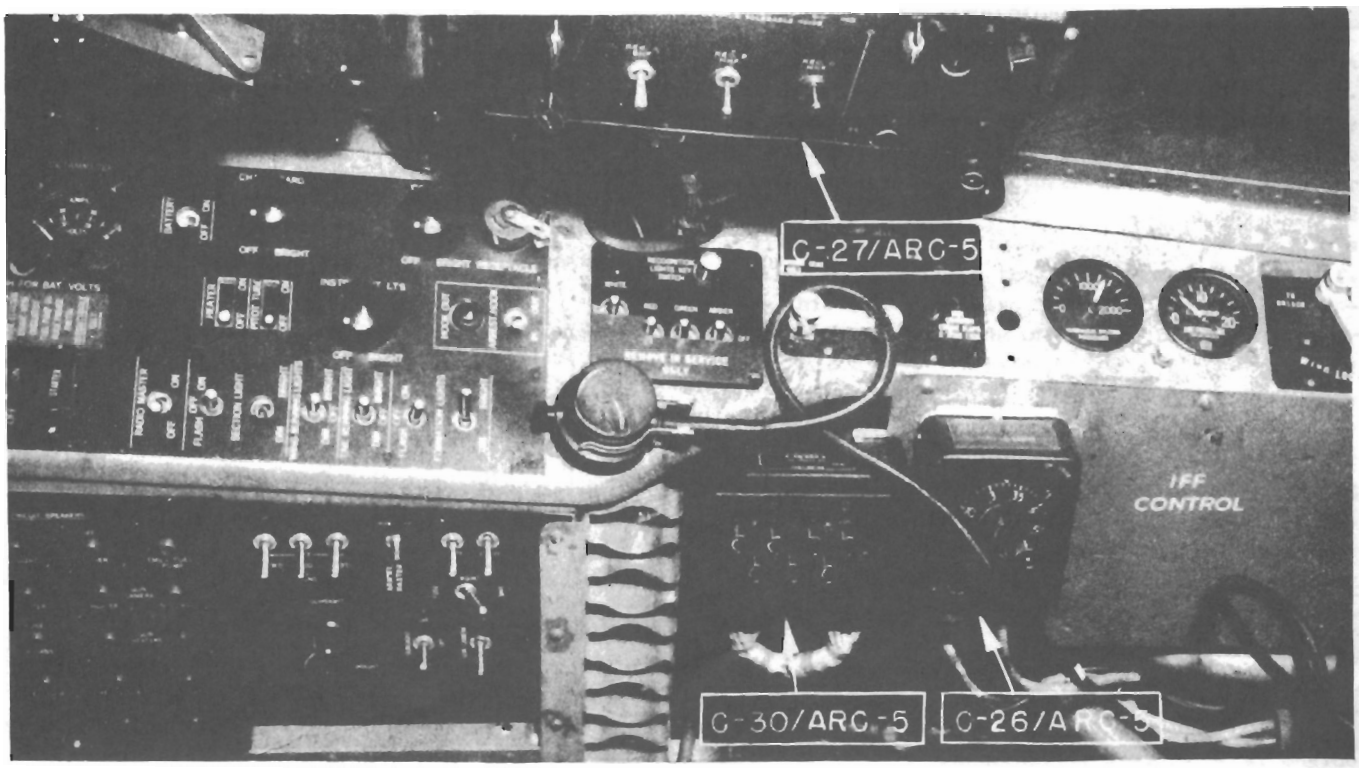


Figure 41 - Radio Controls (Early Models)

SECTION V

OPERATIONAL EQUIPMENT

1. ARMAMENT.

a. GUNS.

(1) This airplane is equipped with six 50 calibre machine guns, three in each outer wing panel. The guns are fired electrically by a trigger switch located on the forward side of the surface control stick.

(2) The gun master switch and selector switches are located on the armament panel. See Figure 42. The guns are safetied hydraulically by the two control handles located on the lower center control panel. See Figure 24. To safety guns, turn handle to safety position and push in. To charge guns turn handle to charge position and push in. If the engine driven hydraulic pump is not functioning the guns can be safetied or charged by turning the hand pump selector valve to gun charging position, then operate the hand pump. Approximately 800 p.s.i. is required to operate.

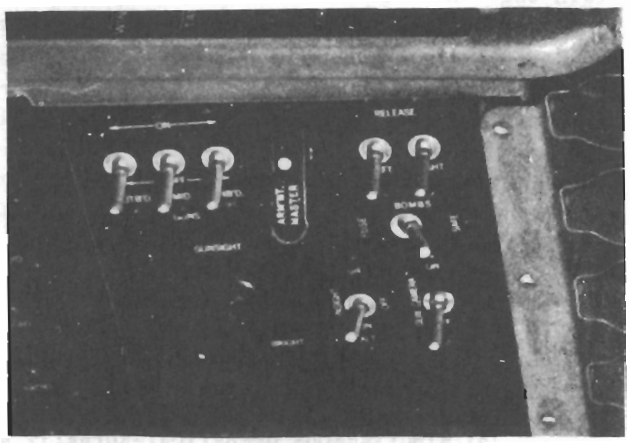


Figure 42 - Armament Control Panel - F6F-3

b. GUN HEATERS.

The guns are heated by electric heaters which are clamped over the gun breech. The pilot does not have any control for the gun heaters as they are wired direct to the generator through circuit breakers located in the cockpit. If the circuit breakers open, the pilot shall push in on the button. There is a plug provided in the landing gear wheel-well where an outside source of power can be plugged in, while the airplane is standing idle, if it is desired to heat guns before take-off.

c. GUN SIGHT.

(1) A Mark 8 electric gun sight is mounted on the center of the airplane just above the main instrument panel. See No. 7 on Figure 21.

(2) The control switch and rheostat for the gun sight are mounted on the armament panel. See Figure 42. The rheostat controls the intensity of the lamp. This lamp has two filaments therefore the control switch has two positions: ON and ON ALTERNATE. If lamp fails, throw switch to ON ALTERNATE position. A manual reset circuit breaker is on circuit breaker panel. A spare lamp is clipped to the gun sight mount and may be installed during flight.

d. BOMBS.

(1) This airplane is provided with two bomb rack supports located under the wing center section, left and right of the center line of the fuselage. These racks accommodate bombs up to 1000 pounds.

(2) The bombs are released by pressing the button located on top of the surface control stick. The bomb selector switches and fusing switch are located on the armament panel. When operating the F6F-3N as a bomber the right hand bomb should be released first as this airplane is right wing heavy because of the antenna nacelle.

e. GUN CAMERA.

The gun camera is located in the leading edge of the wing center section on the left hand side of the airplane. The control switch for the gun camera is located on the armament panel, see Figure

42. When this switch is in "ON" position the gun camera will operate when the machine gun trigger switch is held on.

f. RADAR.

The RADAR equipment is installed in the F6F-3N known as the NIGHT FIGHTER. The receiver and transmitting equipment is located in the fuselage. The control box and pattern change switch are located on the left hand side of the cockpit just above the engine control quadrant. The indicator for the RADAR is located on the center line of the main instrument panel. The antenna is operated electrically and is located in a nacelle located on the right hand outer wing panel near the tip. The main instrument panel on this airplane has special lighting and spare lamps are provided in a receptacle located on the panel for the convenience of the pilot's for replacement during flight operations.

2. COMMUNICATIONS.

a. GENERAL.

Except for the microphone "press-to-talk" switch, all controls and jacks required for operation of the radio communication and radio navigation equipment, are located on the right hand side of the cockpit. The hand-held microphone "press-to-talk" switch is located on the microphone and the mask microphone "press-to-talk" switch is located on top of the throttle control handle.

(2) Current airplanes, Bureau Serial No. 41295 and subsequent, are equipped with AN/ARC-5 communication equipment and AN/ARR-2 navigation receiver equipment. (See Figure 40.) Previous airplanes are equipped with the ATA and ARA communication equipment and either a ZB adapter or ZBX navigation receiver. (See Figure 41) The current installations are identified by pre-set channels which are selected by push-button and cranks, the older installations by tuning dials ("coffee-grinders"). The current airplanes are equipped with a radio master switch, located on the main electrical panel, which supplies power to the radio in the ON position. The previous airplanes are wired so that power is supplied to radio when the battery switch is turned ON.

(3) For ferry operation a LF receiver is provided with the current airplanes, which is controlled by a "coffee-grinder" type control unit, C-26/ARC-5. Figure 40 shows the cockpit control set up for ferry operation. For combat operation, the C-26/ARC-5 control unit is removed and the LF receiver is replaced by an HF pretuned receiver. Except for this change, combat and ferry operation are similar.

b. OPERATION (CURRENT AIRPLANES).

(1) RECEPTION.-Plug the microphone and headset into Jack Box, J-22A/ARC-5, located just under the destructor switch. Turn on the radio master switch. The procedure necessary to put the various receivers in operation is as follows:

(a) VHF RECEIVER.-Push one of the four top buttons on the Transmitter Control Unit, C-30/ARC-5 to select the VHF channel desired; the push button acts as an ON switch as well as a channel selector. Switch to the REC-IN position on the VHF Receiver Control Unit C-27/ARC-5. With the toggle switch on the HF Receiver Control Unit in the OUT position, and the OUTPUT control knob on the C-2/ARR-2 Receiver Control Unit in the minimum output position, reception will be obtained only on the VHF channel selected.

(b) HF RECEIVER.-Set the HF Control Unit (second C-27/ARC-5 unit from the left) toggle switch in the REC-IN position and set the sensitivity control, marked "SET FOR MAX. TOLERABLE NOISE". Make certain that the toggle switch on the VHF Receiver Control Unit is in the OUT position, and that the OUT-PUT control knob on the C-2/ARR-2 Receiver Control Unit is in the minimum position while thus setting the level.

(c) NAVIGATION RECEIVER.-Operate the crank on the C-2/ARR-2 Receiver Control Unit to bring the assigned channel number in the window. Set the NAV-VOICE selector switch to NAV. After making certain that the toggle switches on the VHF and HF Receiver Control Units are in the OUT position. set the OUT-PUT control to obtain a usable weak signal, or if the desired signal cannot be heard, to a fairly strong background hiss. The volume control on the Jack Box, J-22A/ARC-5 should not be adjusted after once being set when navigating with the AN/ARR-2. Initially, the volume control on J-22A/ARC-5 should be set as high as can be tolerated and the OUT-PUT control of the AN/ARR-2 operated as low as possible. Adjust the BEAT-NOTE control to produce a pleasing audible tone. If the signal is too strong, a clear-cut indication of the course cannot be obtained.

(d) SIMULTANEOUS OPERATION.-Normally all three receivers should be in operation with their outputs fed simultaneously into the headphones, unless specific orders to the contrary have been received. The volume control on the Jack Box, J-22A/ARC-5, must necessarily be adjusted to obtain optimum out-put from the VHF Receiver. To obtain the same out-put from the HF receiver, it is therefore necessary to adjust the sensitivity control on the

HF Receiver Control Unit. The volume of the Navigation Receiver should be adjusted only by its own OUT-PUT control. In ferry operation, the Range Receiver out-put should be adjusted only by its own volume control, with the jack box volume control in the full ON position.

(2) TRANSMISSION.-When the receiving equipment has been put in operation by means of the procedure described above, the transmitters may be put in operation as follows:

(a) VHF TRANSMITTER.-Select the desired VHF channel by pushing one of the top four push-buttons on the C-30/ARC-5 Transmitter Control Unit. Make certain that the TONE-CE-VOICE switch is in the VOICE position. Wait four seconds after operating the push-button, then press the "press-to-talk" switch on the hand-held microphone, and commence your transmission. If a mask microphone is being used, the throttle switch must be pressed. To receive, release the "press-to-talk" switch.

(b) HF TRANSMITTER.-Push button #2 on the C-30/ARC-5 Transmitter Control Unit. Make certain that the TONE-CW-VOICE switch is in the VOICE position. Wait four seconds after pushing button #2, then press the "press-to-talk" switch and begin transmitting. It should be noted that pushing button #2 does not in any way disturb reception on the VHF channel; the HF channel is merely added to the other channels in use. Button #3 is not used in this installation.

c. OPERATING NOTES AND PRECAUTIONS.

(1) AFTER PUSHING ANY ONE OF THE TOP FOUR BUTTONS ON THE C-30/ARC-5 TRANSMITTER CONTROL UNIT, WAIT AT LEAST FOUR SECONDS BEFORE PUSHING BUTTON #2. IF THIS CAUTION IS NOT OBSERVED, THE BAND SELECTOR MOTOR MAY CONTINUE TO RUN AND DANGEROUSLY OVERHEAT. IT MAY BE STOPPED BY PRESSING BUTTON "A", "B", "C", OR "D". BUTTON #3 IS SUBJECT TO THE SAME LIMITATIONS AS BUTTON #2, but it should not be pushed because RADIO TRANSMISSION WILL NOT TAKE PLAN, in spite of the fact that sidetone will be heard. All buttons on the C-30/ARC-5 Control Unit, except the OFF button, turn the transmitters ON in addition to selecting the proper channel. The various channels are selected in turn as desired. At the conclusion of the transmission, the transmitters are shut down by pushing the OFF button.

(2) Voice transmission, only, is provided by this installation, although the selector switch on the Transmitter Control Unit, C-30/ARC-5, is labeled TONE-CW-VOICE. The selector switch should be set to VOICE at all times, preferably safety-wired.

(3) Reliable operation of the VHF and Navigation equipment is generally confined to approximately line-of-sight distance as determined by the height of the transmitting and receiving antennas, but since transmission at these frequencies depends on meteorological conditions, large deviations from the line-of-sight distance may occur in certain areas. HF communication for ranges under approximately 40 miles communication depends on sky-wave transmission and the results depend on the frequency, time of day, the season and other factors, rather than transmitter and receiver heights.

3. OXYGEN.

a. CYLINDER AND CONTROL.

(1) A standard 514 cu.in. capacity shatter proof oxygen cylinder is installed in the fuselage abaft the pilot's rear bulkhead. The cylinder should be charged to 1800 p.s.i.

(2) The shut-off valve handwheel, connected to the cylinder, is mounted on the pilot's rear bulkhead to the left of the seat.

TO OPEN - ROTATE COUNTER-CLOCKWISE

(3) A flow indicator is installed above the regulator on the lower instrument and control panel.

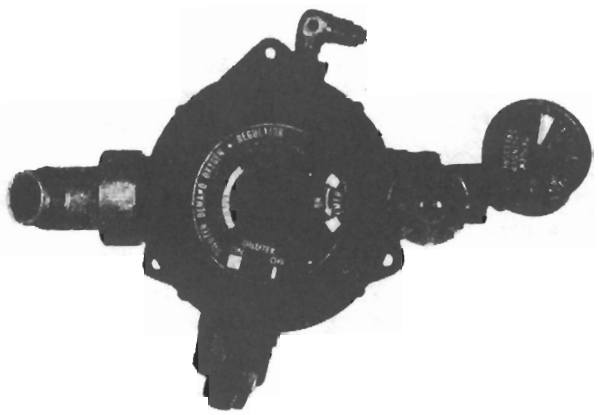


Figure 43 - Oxygen Regulator

b. REGULATOR.

(1) 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 or 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 30000 ft. beyond, which 100% cylinder oxygen is delivered. With the air-valve set to the OFF or 100% OXYGEN position, 100% oxygen is delivered at all altitudes. With the air-valve of the diluter-demand regulator set to the ON or 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.

(2) The regulator is attached directly to the high pressure oxygen supply through 3/16 inch O.D. copper tubing connected to the cylinder; the pressure in the cylinder may decrease from 1800 to 2000 pounds per square inch to 50 pounds per square inch without effecting the normal operation of the regulator.

c. PRE-FLIGHT CHECK LIST.-The following items shall 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.

(1) Emergency Valve: Closed.

(2) Open cylinder valve, allow at least ten seconds for pressure in line to equalize. Pressure gage should read 1800 ±50 p.s.i., if the cylinder is fully charged.

(3) Close cylinder valve. After a few minutes observe pressure gage and simultaneously open cylinder valve. If gage pointer jumps - leakage is indicated.

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

(4) 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. DO NOT USE MASK THAT LEAKS.

(5) Couple mask securely to breathing tube by means of quick disconnect coupling. IMPORTANT: Mating parts of coupling must not be "cocked" but be fully engaged.

(6) 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.

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" or "100% OXYGEN" and test again. If oxygen flow indicator operation is now satisfactory, reset air-valve to "ON" or "NORMAL OXYGEN" in which setting adequate oxygen flow and "blinker" operation will be assured at oxygen use altitudes.

(7) Check Emergency Valve by turning counter-clockwise slowly until oxygen flows vigorously into mask - then close Emergency Valve.

(8) Upon completion of oxygen flight - close cylinder valve.

d. OPERATING INSTRUCTIONS.

(1) Open oxygen cylinder valve. Pressure gage should read 1800 ± 50 p.s.i., if cylinder is fully charged.

(2) Set air-valve to "ON" or "NORMAL OXYGEN" position - except when the presence of excessive carbon-monoxide is suspected - then set to "OFF" or "100% OXYGEN" position.

(3) Put on oxygen mask. Be sure that quick disconnect coupling is fully engaged.

(4) 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".

(5) Breathe normally and observe Oxygen Flow Indicator (if installed) for "blink", verifying positive flow of oxygen.

(6) Frequently check cylinder pressure gage for state of available oxygen supply, and Oxygen Flow Indicator for flow of oxygen to mask.

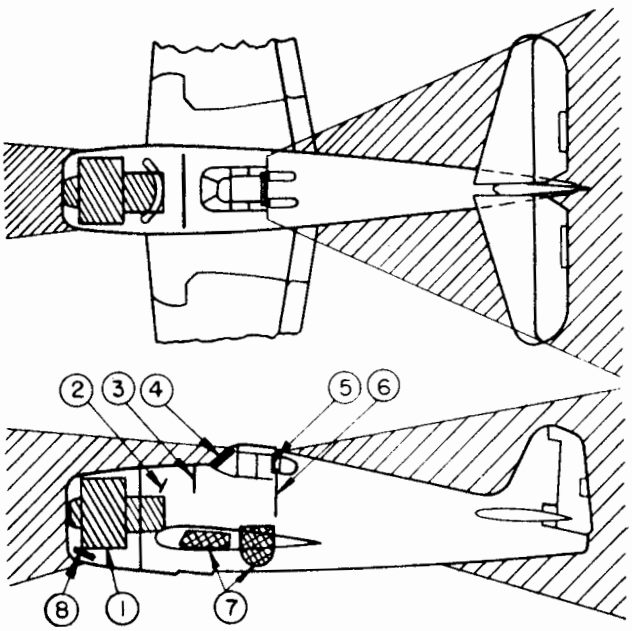
(7) Upon completion of oxygen flight - close cylinder valve (rotate handle CLOCKWISE).

CAUTION

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

APPENDIX I

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.



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 44 - Pilot Protection from Gunfire

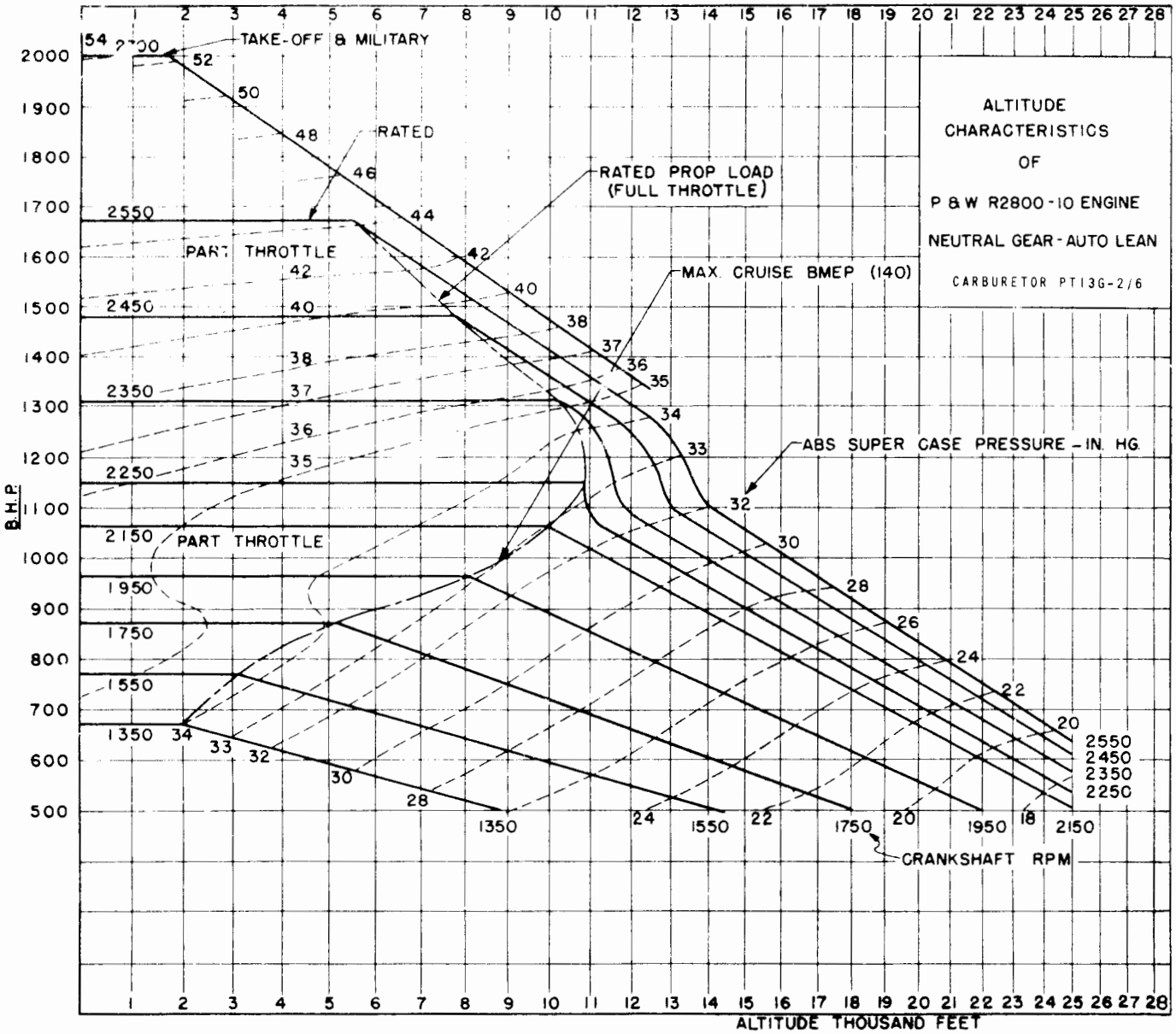


Figure 45 - Engine Calibration Curve - Neutral Blower

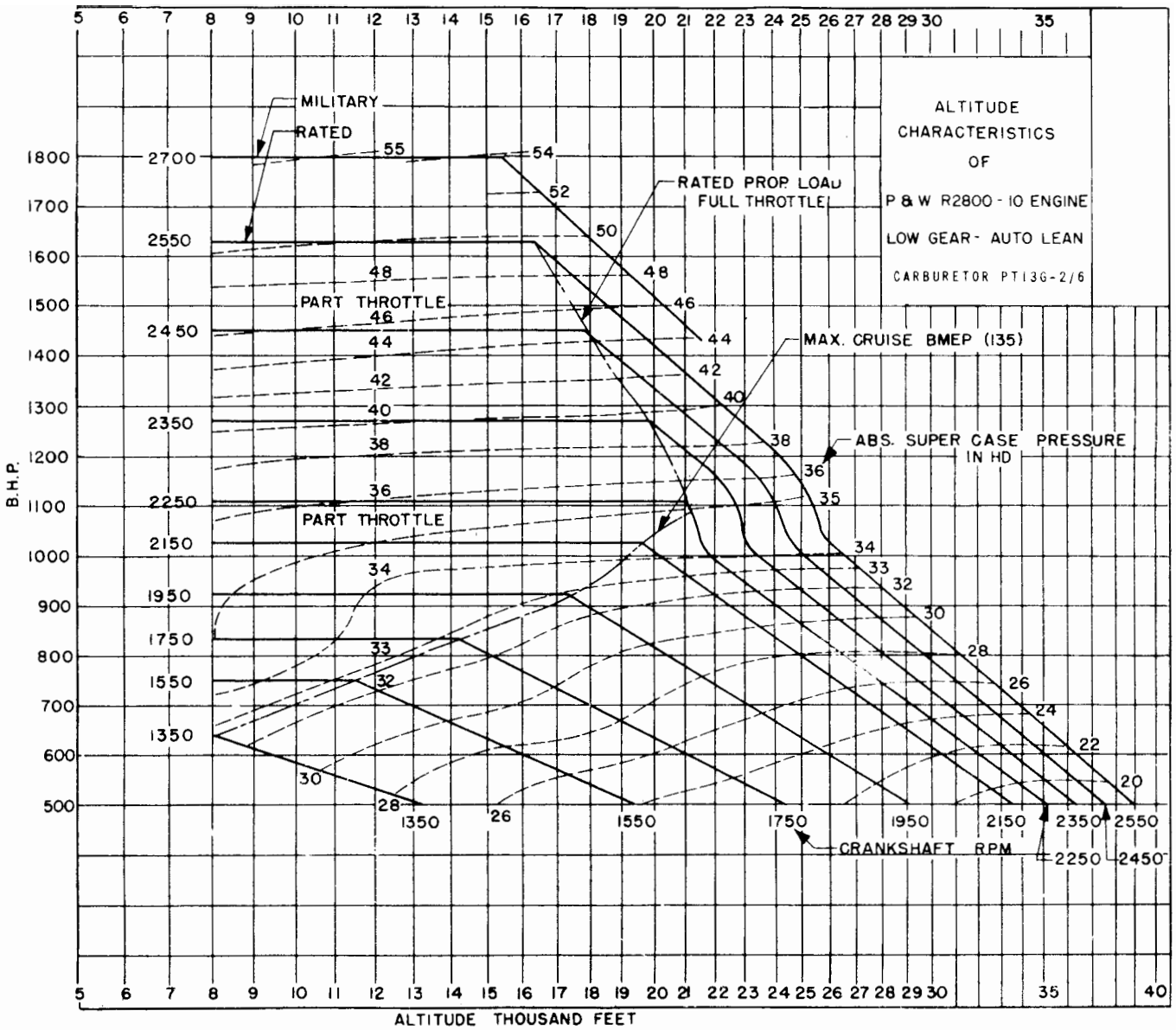
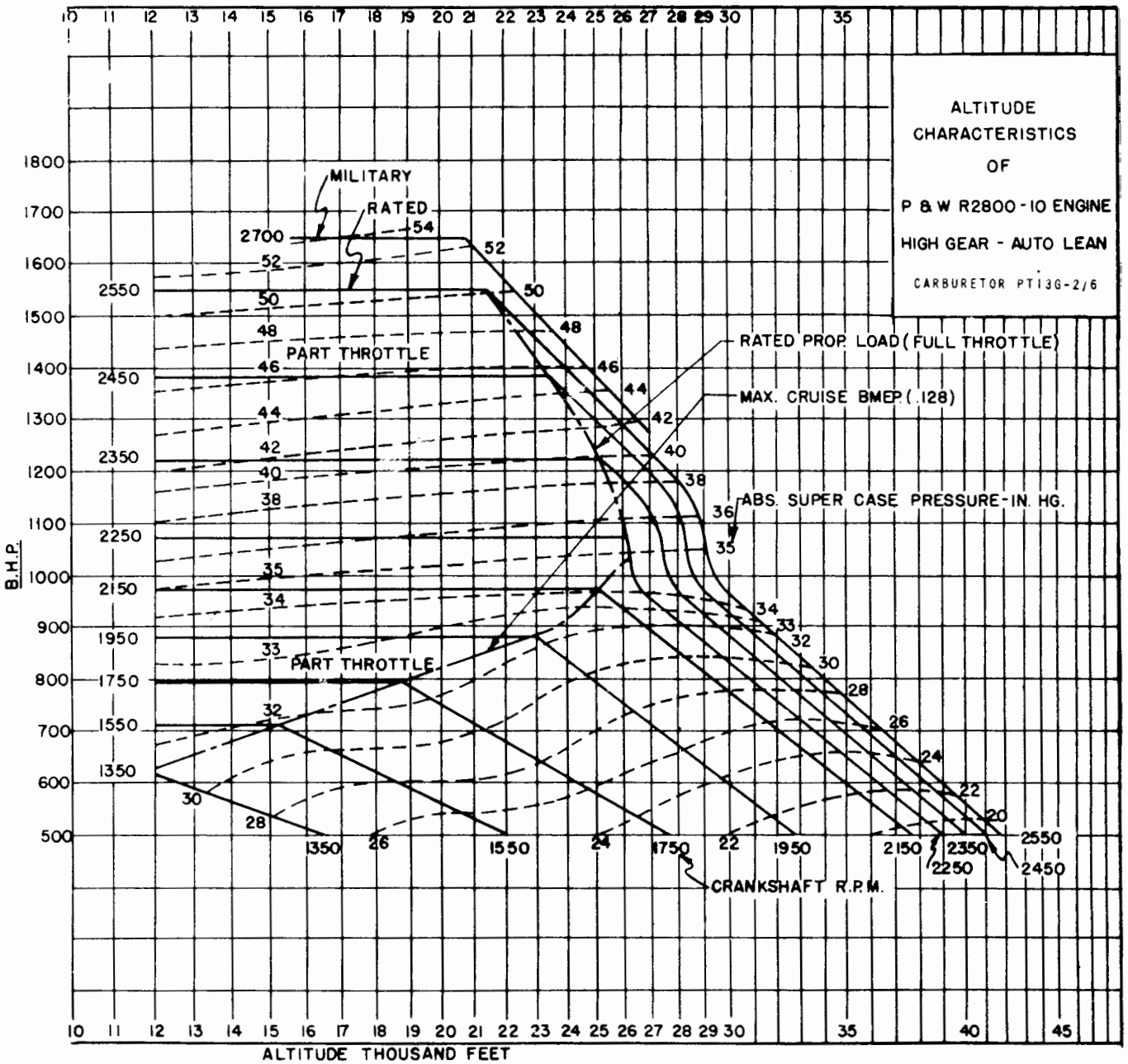


Figure 46 - Engine Calibration Curve - Low Blower

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.



This chart is for use in estimating power developed. For recommended Power Control settings, see Specific Engine Flight Chart, Figure 39.

Figure 47 - Engine Calibration Curve - High Blower

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.

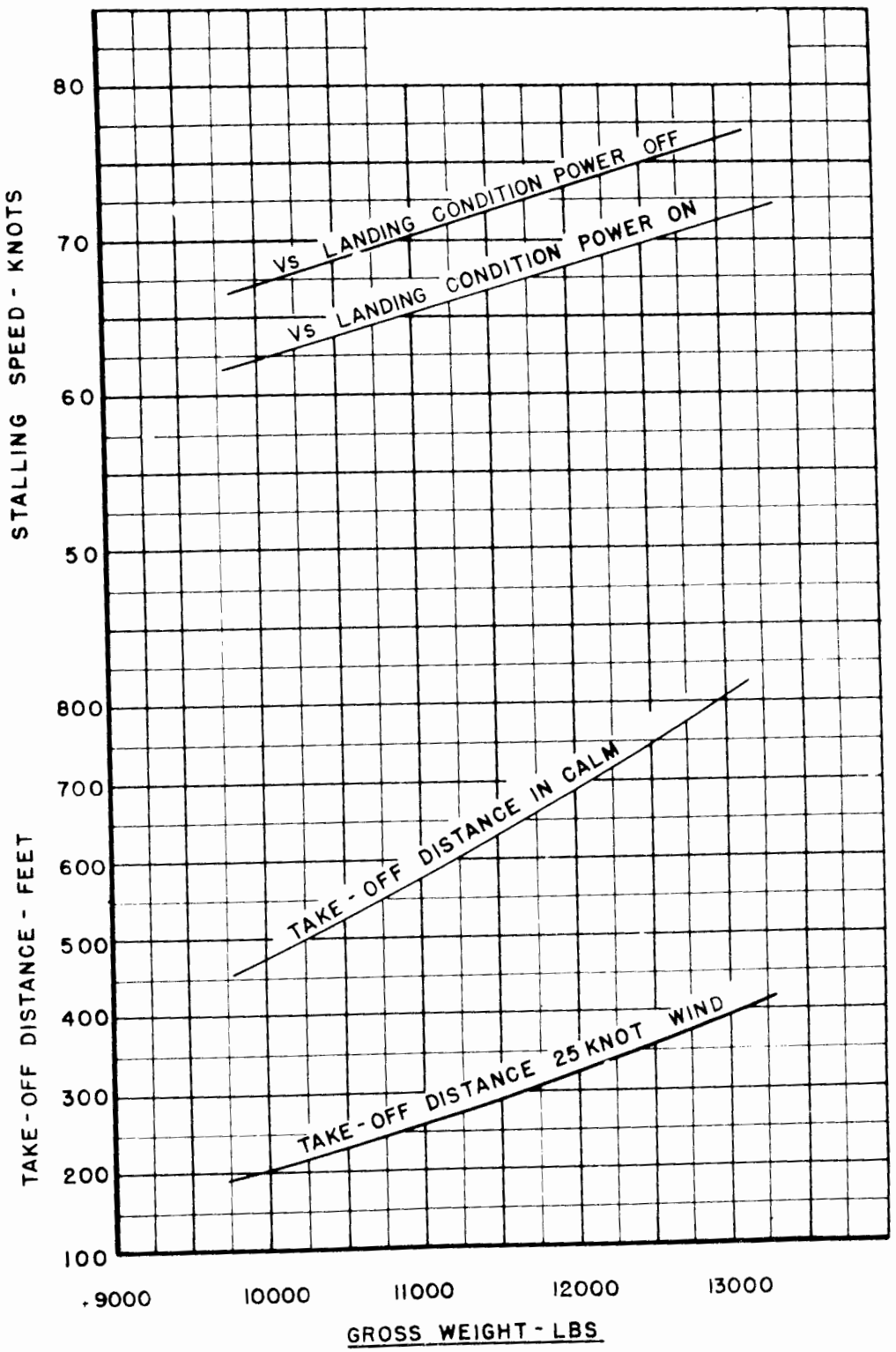


Figure 48 - Take-Off - Run & Stalling Speed Chart

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.

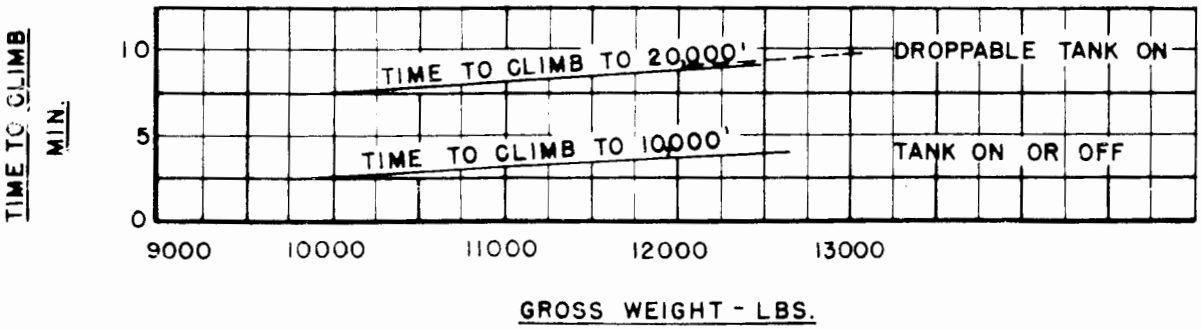


Figure 49 - Climb Chart