Pilot's Handbook

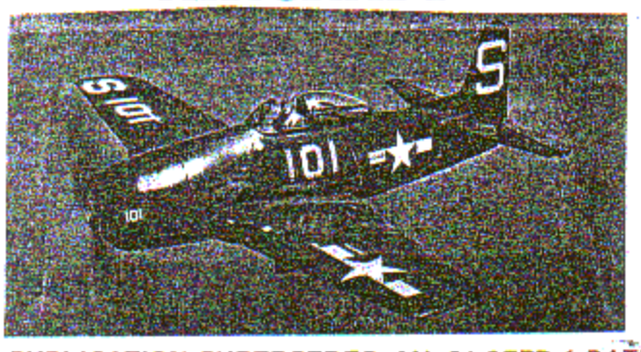
for

NAVY MODELS

F8F-1 • F8F-1B • F8F-1N

F8F-2 • F8F-2N • F8F-2P

AIRCRAFT



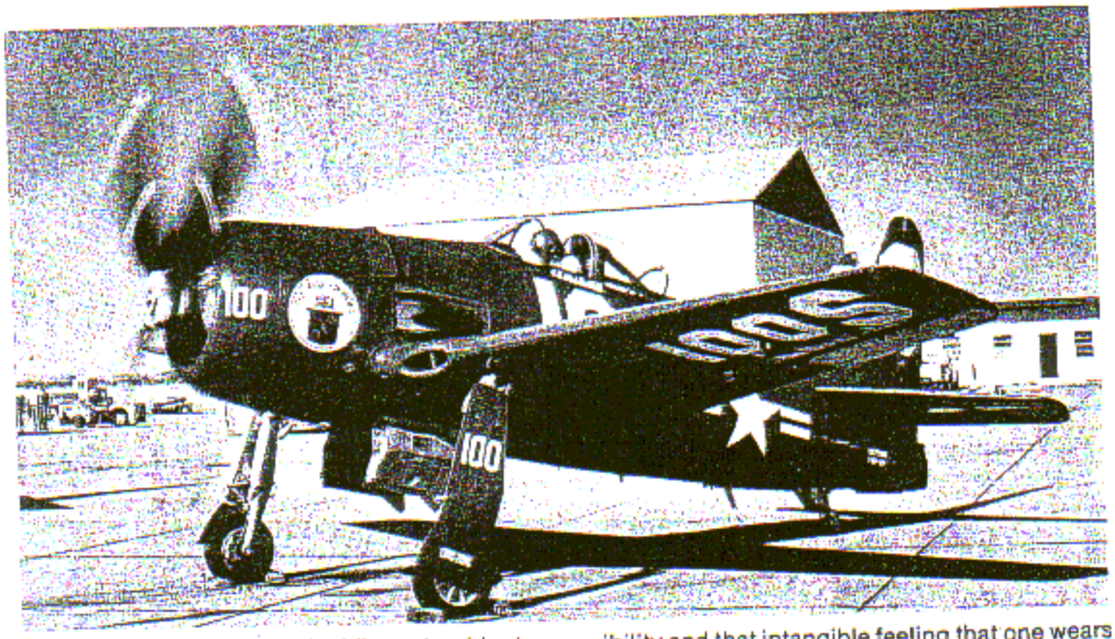
THIS PUBLICATION SUPERSEDES AN 01-85FD-1 DATED
1 APRIL 1948 REVISED 15 JANUARY 1949

APPENDIX 1 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

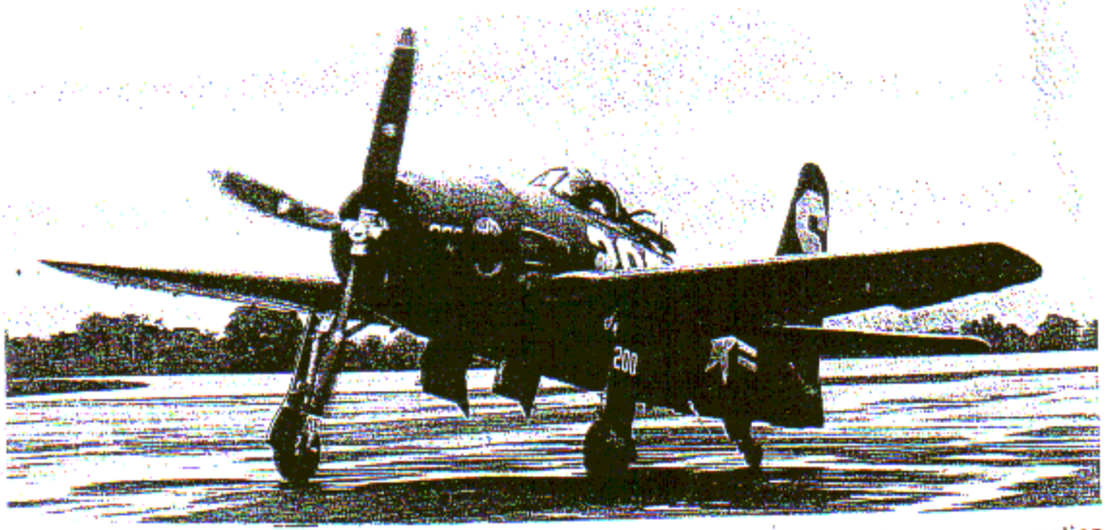
PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE
AND THE CHIEF OF THE BUREAU OF AERONAUTICS

TABLE OF CONTENTS

ILLUSTRATIONS



The F8F-2 has a taller vertical fin and rudder to give the airframe better lateral stability. Universally pilots have found very little to criticize about the Bear—it has sterling maneuverability, light controls, outstanding speed, superior visibility and that intangible feeling that one wears it like a pair of pants rather than sitting inside an airplane. The cockpit is well laid out with everything in easy reach of the pilot. *US Navy*



Though the R-2800 is a massive engine, the Bearcat's cockpit, as with the earlier Hellcat, is set atop the fuselage to give the pilot maximum visibility, both in the air and on the ground. Taxiing does require S-turning, but not as much as in the Corsair and other wartime fighters. Restoration and maintenance of an F8F are complex since the aircraft was a generation removed from earlier World War II fighters. Hydraulics run throughout the airframe and its basic construction is more complex, requiring some talented sheet metal and structures engineers for a good rebuild. *Jim Sullivan*

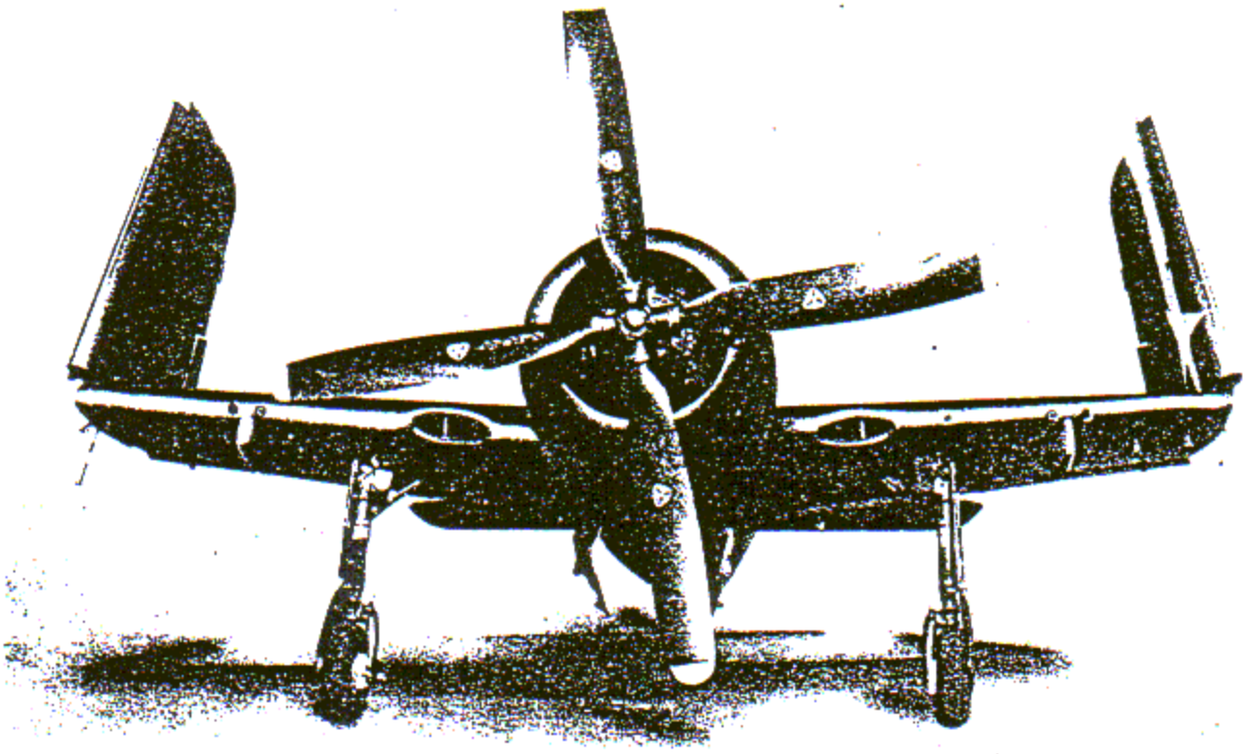


Figure A—F8F-1 Airplane—Wings Folded

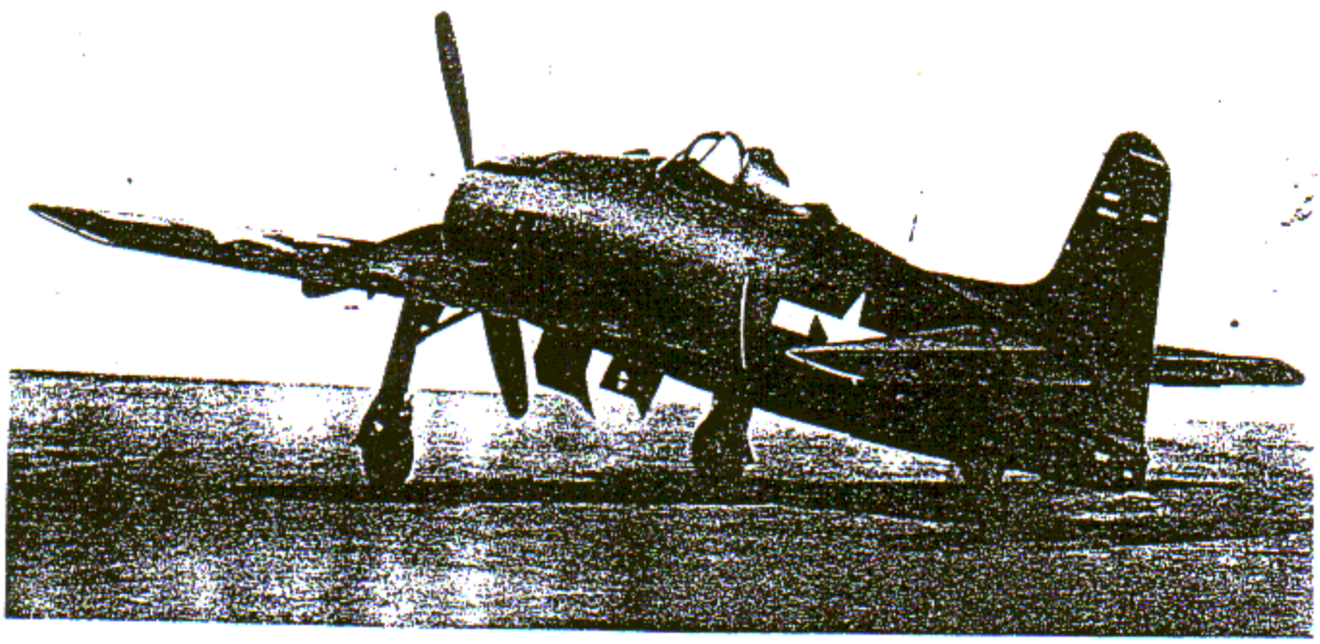


Figure B—F8F-1 Airplane—¼ Left Rear View

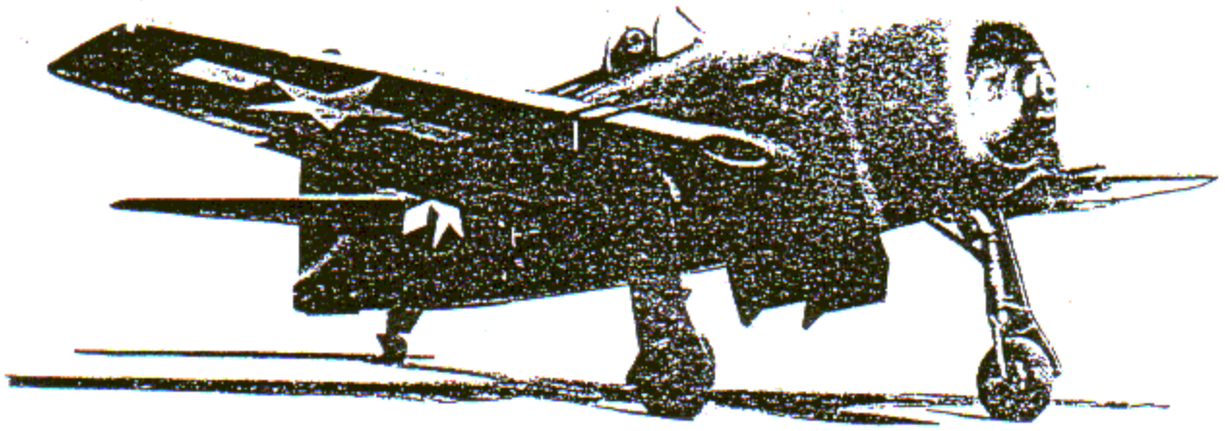


Figure C—F8F-1B Airplane—¾ Right Front View

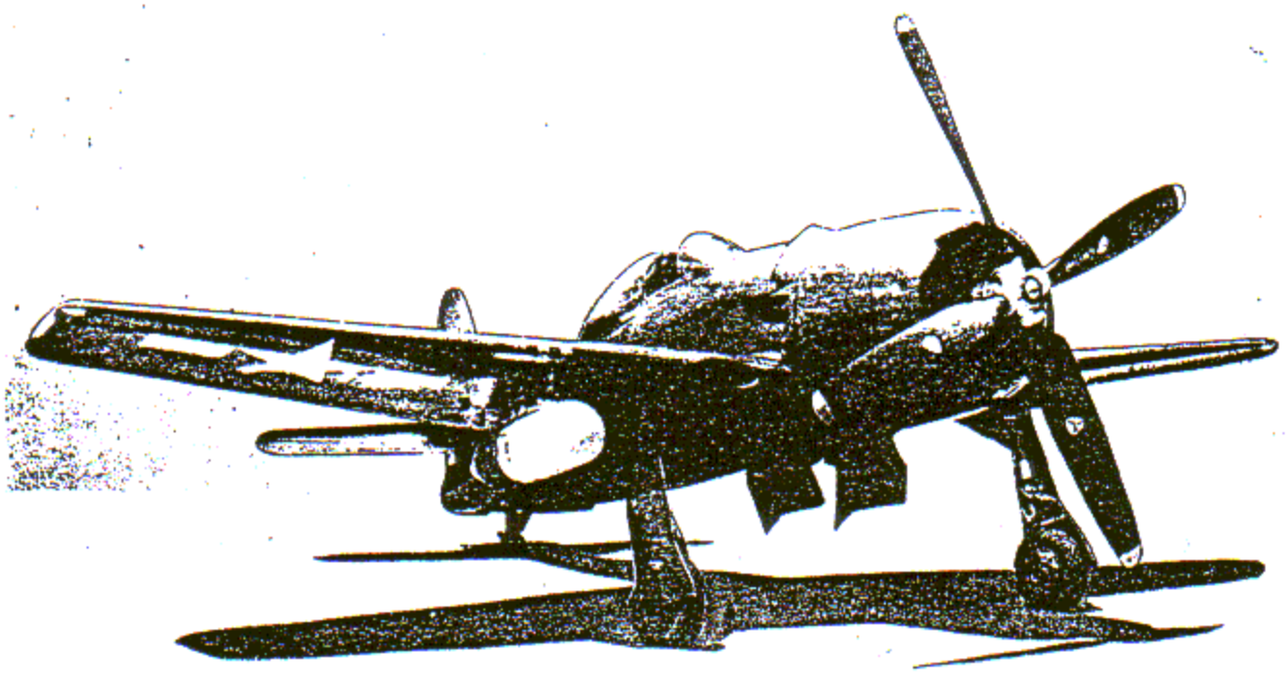


Figure D—F8F-1N Airplane—¾ Right Front View

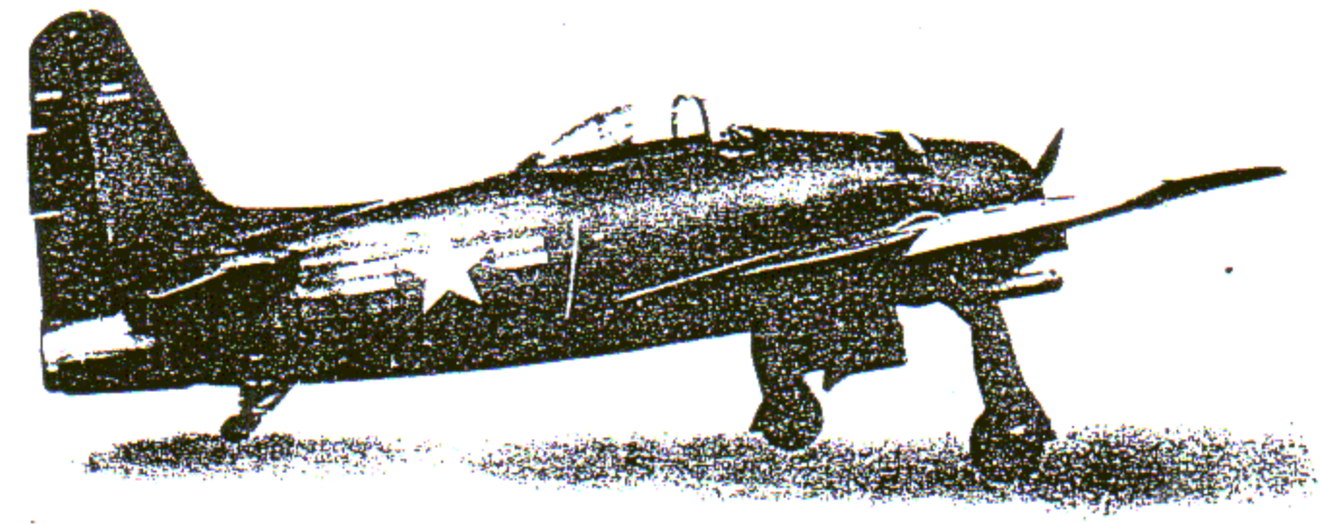


Figure E—F8F-2 Airplane—¾ Right Rear View (-2N identical except for radar bomb rack)

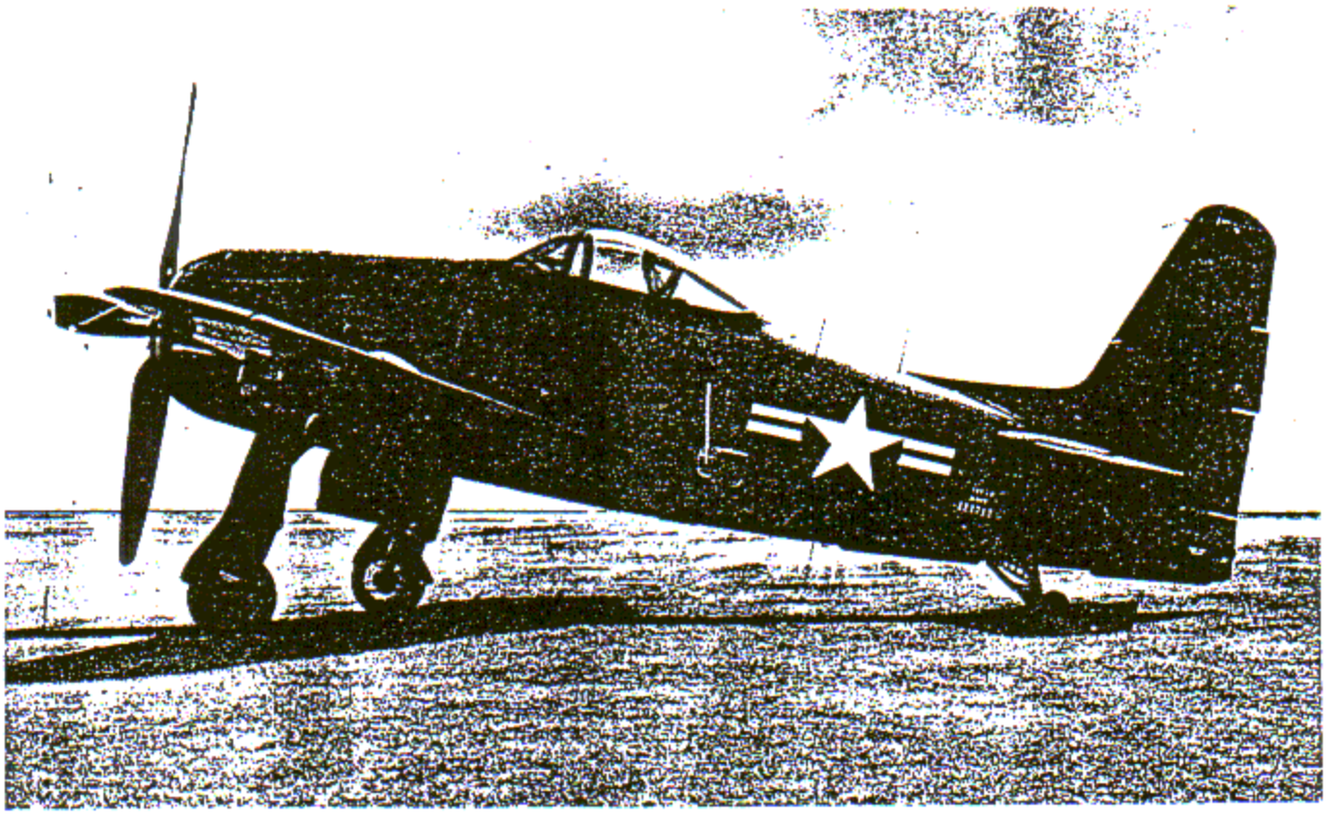


Figure F—F8F-2P Airplane—Left Side View

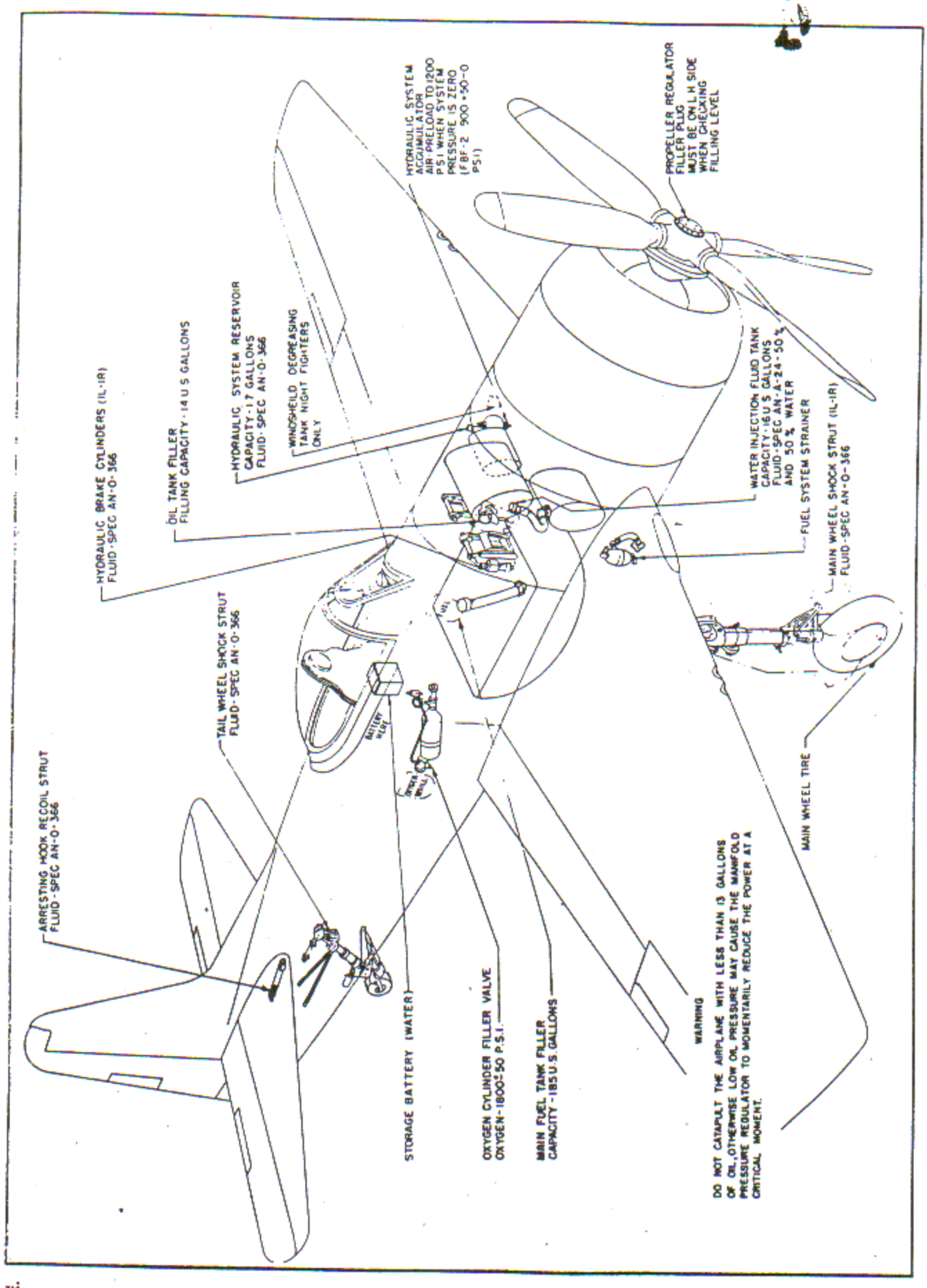


Figure G—Service Diagram

SECTION 1
DESCRIPTION

1. AIRPLANE.

a. GENERAL.—The F8F airplane is a single engine, folding low-wing fighter. It is designed for either unassisted or catapult take-off from aircraft carriers. Landing gear, wing flaps, dive recovery flaps, gun chargers, and oil cooler duct shutters are operated hydraulically; cowl flaps are operated electrically—arresting hook manually.

(1) The single self-sealing fuel cell, located beneath the cockpit floor, has a capacity of 185 gallons. A 150 gallon droppable tank may be installed on the fuselage bomb rack and a 100 gallon droppable tank on each wing bomb rack.

(2) The armament consists of four .50 cal. machine guns, two in each side of the wing center section. In the F8F-1B,-2,-2N and -2P airplanes, the 20 mm cannon replace the .50 cal. guns. Three bomb racks are installed, one in the fuselage and two on the center section, left and right. Two sets of rocket launchers are fitted to the center section adjacent to each folding axis.

b. WEIGHT.

Model	*(*) Weight*
F8F-1	9,600
F8F-1B	10,000
F8F-1N	9,900
F8F-2	10,400
F8F-2N	10,600
F8F-2P	10,100

(*These weights are average normal gross weights which include pilot, ammunition, oil and capacity internal fuel—185 gallons.)

c. DIMENSIONS.

Span (Wings Spread)	35′ 6″
Span (Wings Folded)	23′ 3″
Fuselage (Height Overall—3 Pt.)	13′ 8″
Fuselage (Length Overall)	27′ 6″

2. POWER PLANT.

a. GENERAL.

(1) The F8F-1,-1B and -1N airplanes are powered by a Pratt & Whitney R-2800-34W single stage, two speed, supercharged engine which is equipped with a water injection system.

(2) The F8F-2,-2N and-2P airplanes are powered by a Pratt & Whitney R-2800-30W single stage engine equipped with a variable speed supercharger, automatic engine control unit (AEC) and water injection system.

(3) Both engines drive a hydraulically controlled, constant speed, four bladed Aeroprop propeller.

3. POWER PLANT CONTROLS.

a. CONTROL QUADRANT.—The control quadrant is located on the left hand side of the cockpit and carries the following controls:

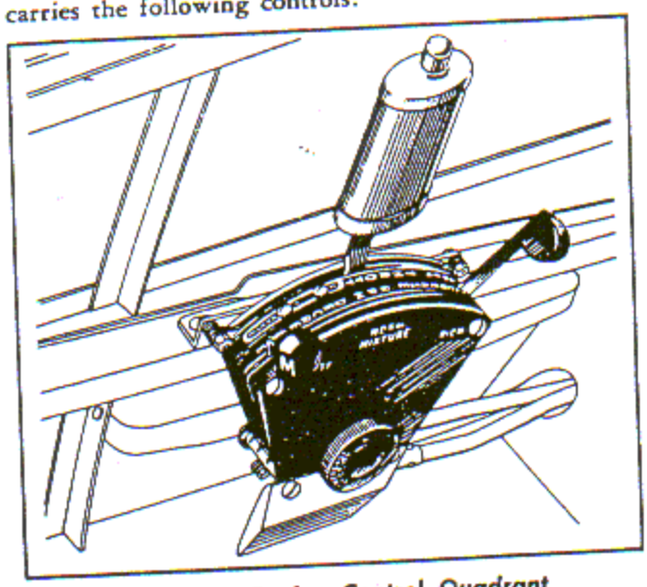


Figure 1—Engine Control Quadrant

(1) THROTTLE (BOOST) CONTROL.

(a) GENERAL.—On airplanes which are not equipped with a manifold pressure regulator (F8F-1 series) or an AEC unit (F8F-2 series), operate the throttle in the conventional manner. In airplanes equipped with a manifold pressure regulator or AEC unit (Serial No. 94754 and subsequent), the throttle lever is occasionally known as a "boost control", and is utilized to set the regulator to maintain the manifold pressure desired. Once set in this manner, the regulator automatically controls the carburetor throttle to maintain constant manifold pressure at any altitude below critical altitude. Above critical altitude, manifold pressure will vary just as it does at full throttle when a conventional control is used. Thus the pilot is relieved of controlling manifold pressure as he changes

engine rpm, and airplane altitude and speed. However, he must observe manifold pressure limits when setting the boost control and guard against excessive manifold pressure when rpm is reduced. No harm will result from advancing the boost control to full forward position for take-off or military power, provided the water injection switch is "OFF" as the maximum manifold pressure available is controlled by the regulator.

Note

As this practice is not safe in other aircraft models not equipped with similar manifold pressure regulation, it is essential that pilots avoid letting the habit of using full throttle carry over when flying such other aircraft.

(b) MANIFOLD PRESSURE REGULATOR—F8F-1.—With the manifold pressure regulator installation, the boost control is connected to the regulator which in turn is connected to the carburetor throttle. The pilot sets the regulator for the desired manifold pressure through movement of the boost control, and the regulator, by hydraulic servo operation of the carburetor, maintains this setting. To do this, the regulator obtains its hydraulic power from the main engine oil pressure. As a safety precaution, the unit is so designed that in the event of failure of the oil supply to the regulator, the pilot will have manual control of the throttle below 47 in. Hg in high blower and 41 in. Hg in low blower at 2800 rpm.

1. It should be noted that when making a military rated power climb, the pilot can shift from low to high blower and the regulator will automatically reset the manifold pressure to the required value, without requiring a change in the boost control position.

(c) AUTOMATIC ENGINE CONTROL (AEC)—F8F-2. — With the AEC installation, the boost control is connected to the AEC unit which in turn is connected to the carburetor throttle and also to the supercharger control. The pilot sets the AEC unit for the desired manifold pressure through movement of the boost control and the AEC unit by hydraulic coupling of the blowers, maintains this setting. To do this, the couplings obtain their hydraulic power from the main engine oil pressure. As a safety precaution the AEC unit is so designed that in event of failure of the unit's oil supply, the pilot will have manual control of the throttle below 45 in. Hg at 2800 rpm. In the event of failure of the engine oil supply, since the supercharger blowers are driven hydraulically by engine oil, an immediate loss of all power will occur.

1. It should be noted that when making a military rated power climb, the AEC will shift from low to intermediate to high blower by automatically resetting the manifold pressures to the required value without requiring a change in position of the boost control.

(2) MIXTURE CONTROL. — Handle marked "M" on inboard side of the control quadrant. The mixture control has three positions, "IDLE CUT-OFF", "NORMAL" and "RICH". Manual leaning of the mixture may be obtained by positioning the control between "NORMAL" and "IDLE CUT-OFF".

(3) PROPELLER CONTROL.—Handle marked "P" on center of the control quadrant. Move the control FORWARD to "INCREASE RPM" and AFT to "DECREASE RPM".

(4) FRICTION ADJUSTMENT KNOB.—The friction adjustment knob is located on the inboard side of the control quadrant. Rotate the knob FORWARD to "INCREASE FRICTION" on the engine controls and AFT to "DECREASE FRICTION".

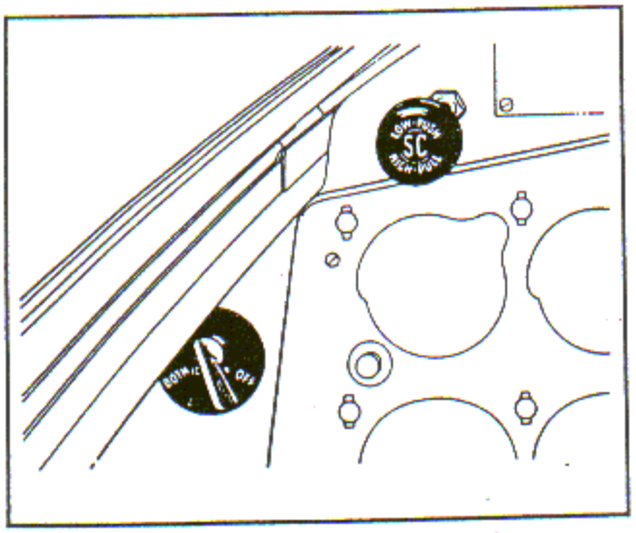


Figure 2—Ignition Switch and Supercharger Control—F8F-1 and Early F8F-2

b. SUPERCHARGER CONTROLS.

(1) In the F8F-1 airplane, the supercharger control is located to the upper left of the main instrument panel. The supercharger control is PUSHED IN for "LOW BLOWER" and PULLED AFT for "HIGH BLOWER".

(2) In the F8F-2 airplane, the supercharger control is located to the upper left of the main instrument

panel. This control has three positions, "LOW", "INTERMEDIATE" and "HIGH" for the operation of the variable speed supercharger on the R-2800-30W engine. Upon installation of an AEC unit (or on airplanes so equipped), this knob will be removed.

c. IGNITION SWITCH.—The ignition switch is located to the left of the main instrument panel. The switch has four positions, "OFF", "L", "R" and "BOTH".

d. PRIMER AND STARTER CONTROLS.

(1) GENERAL.—The primer and starter control switches are located on the electrical distribution panel, primer switch inboard, starter switch (with safety cap) outboard.

CAUTION

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

e. COWL FLAPS CONTROL.

(1) GENERAL.—The cowl flaps control switch is located on the lower center of the main instrument panel.

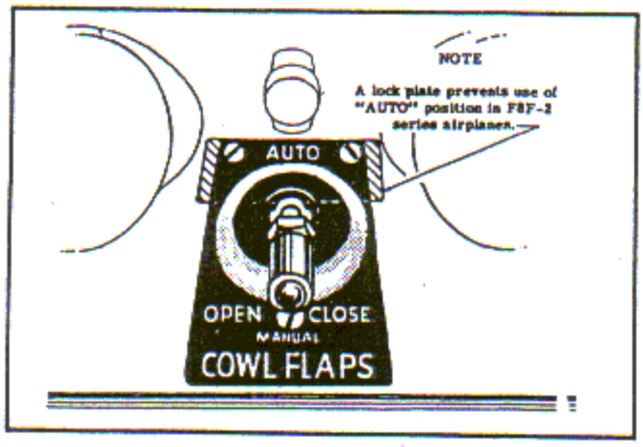


Figure 3—Cowl Flaps Switch

(2) OPERATION.

Switch on CENTER—"OFF".
Switch UP—"AUTO".
Switch DOWN to LEFT—"OPEN".
Switch DOWN to RIGHT—"CLOSE".

(a) Movement of the cowl flaps is effected by electric screw jacks. With the switch on "AUTO", the motor operating the screw jacks is controlled electrically by the cylinder head temperatures, except when the airplane is on the ground; then the flaps are full open. The ground operating position is controlled by a micro switch on the right landing gear nut cracker arm which is connected into the cowl flaps electrical system.

(b) Take off with the cowl flaps switch in "AUTO" position. The flaps will close after take-off and open only if the pre-set cylinder head temperatures are reached.

(c) The "MANUAL" position can be used in the event of failure of the automatic control (both on the ground and in the air), and should be adjusted in accordance with cylinder head temperature readings and visual inspection of the flaps setting. To obtain intermediate settings manually, move switch to "MANUAL"—"OPEN" or "CLOSE" as desired, then set switch to "OFF" position when desired flap position is reached. In case the system is malfunctioning, place the switch on "OFF".

Note

F8F-2 series airplanes are not equipped with the automatic control.

f. CARBURETOR AIR CONTROL.

(1) GENERAL.—The carburetor air control knob is located to the upper right of the main instrument panel. This control has two positions, FULL IN—"DIRECT" and FULL AFT—"PROTECTED AIR".

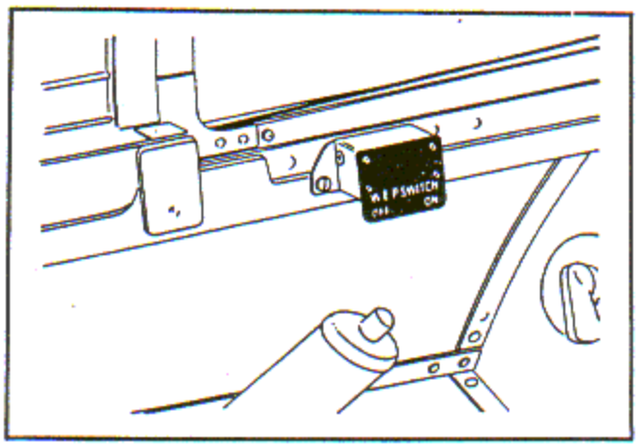


Figure 4—WEP Switch

(2) OPERATION.—In the "PROTECTED AIR" position, warm air enters the carburetor from the engine accessory compartment.

g. WATER INJECTION SYSTEM CONTROL.

(1) GENERAL.—The "WEP" switch (combat power master switch) is located on the cockpit left hand rail adjacent to the engine control quadrant. When this switch is "OFF", both the water pump and solenoid valve in the water line are rendered inoperative.

(2) OPERATION.

Switch AFT—"OFF"
Switch FORWARD—"ON"

(a) F8F-1 series airplanes—Instruction for the use of the water injection system have been incorporated in Section II para 12.

(b) F8F-2 series airplanes—Upon completion of combat power evaluation tests, instructions for the use of the water injection system will be incorporated. Until such instructions are issued, keep the WEP switch in the "OFF" position.

4. FLIGHT CONTROLS.

a. AILERON AND ELEVATOR CONTROLS.—The control stick is equipped with gun trigger, rocket and bomb release switch buttons on the grip. The elevators carry adjustable trim tabs. Spring tabs are installed on both ailerons to assist control. The tab on the left aileron also serves as an adjustable trim tab.

b. RUDDER AND BRAKE CONTROL PEDALS.

(1) ADJUSTMENT.—The standard underhung pedals are adjustable to three positions. The inner pedal arms carry adjustment levers. To adjust the pedals, press the levers down and push the pedals full forward with the toes; then put the toes under the pedals and pull aft one notch at a time until the pedals are in the desired position. Check that each pedal has ratcheted past the same number of notches.

(2) RUDDER CONTROL.—The rudder is operated by cables attached to the rudder pedals. An adjustable trim tab is installed on the rudder.

c. ELEVATOR, AILERON AND RUDDER TRIM TAB CONTROLS.—The three tab controls are installed on the left hand shelf.

(1) The operation of the controls is standard.

(a) Elevator Tab Control (wheel on inboard side of shelf). Rotate FORWARD—"NOSE DOWN".

(b) Rudder Tab Control (knob on top of shelf). Rotate CLOCKWISE—"NOSE RIGHT".

(c) Aileron Tab Control (knob on top of shelf). Rotate CLOCKWISE—"RIGHT WING DOWN".

1. The tab installed on the left aileron serves both as a trim and spring control tab. The two controls function independently and do not affect each other.

d. WING FLAPS CONTROL.

(1) GENERAL.—The wing flaps are moved to the required operating position by setting the flaps hydraulic control lever (spring loaded), located on the side of the left hand shelf, to the selected notch. Pressure relief valves are incorporated in the flap hydraulic system to permit them to blow up with increasing airspeed. See Section II, paragraph 1.*a.*

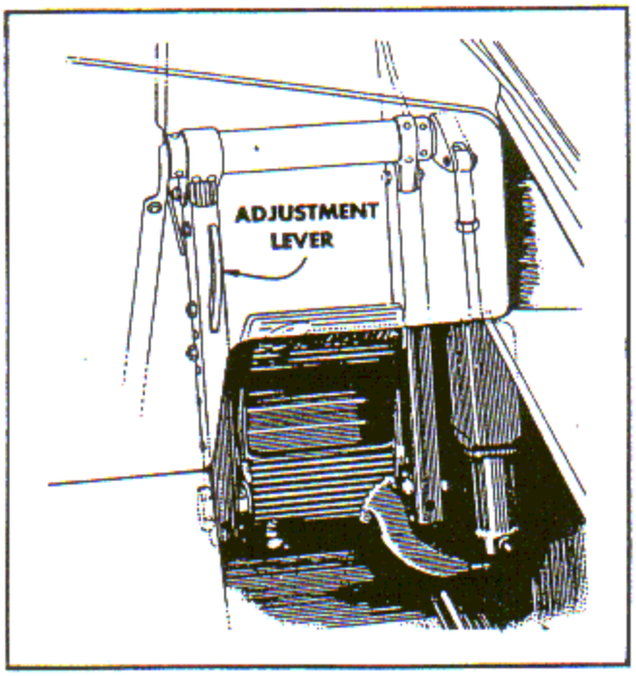


Figure 5—Rudder Pedal

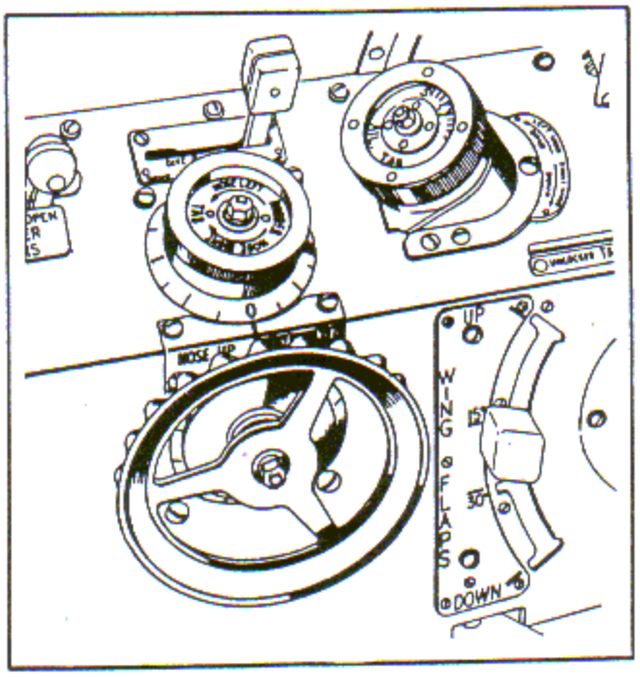


Figure 6—Tabs and Wing Flaps Controls

(2) OPERATION. — Push lever forward from notch then move as follows:

(a) FLAPS "UP".

Lever in top notch.

(b) FLAPS "DOWN".

"15°"—Lever in second notch.
"30°"—Lever in third notch.
"DOWN"—Lever in fourth notch.

(3) The flap position is indicated by horizontal lines painted on the forward edge of the left flap.

CAUTION

1.

For flaps "UP", return lever to top position —first notch.

2.

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

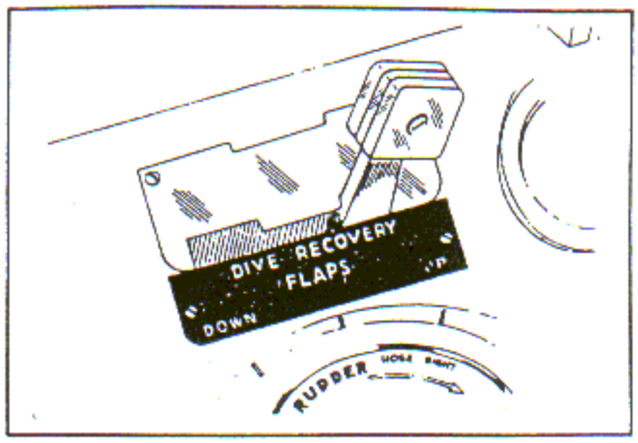


Figure 7—Dive Recovery Flaps Control

3.

If there are no airloads on the flaps, their travel may not be equal as the follow-up system is on the left flap only.

e. DIVE RECOVERY FLAPS.

(1) GENERAL.—Two dive recovery flaps, one each left and right, are installed on the under surface of the wing center section. They are controlled by a hydraulic control lever located on the left hand cockpit shelf just outboard of the trim tab controls.

(2) OPERATION.—Push control lever inboard from notch, then move as follows:

Move lever FULL FORWARD to "UP".
Move lever FULL AFT to "DOWN".

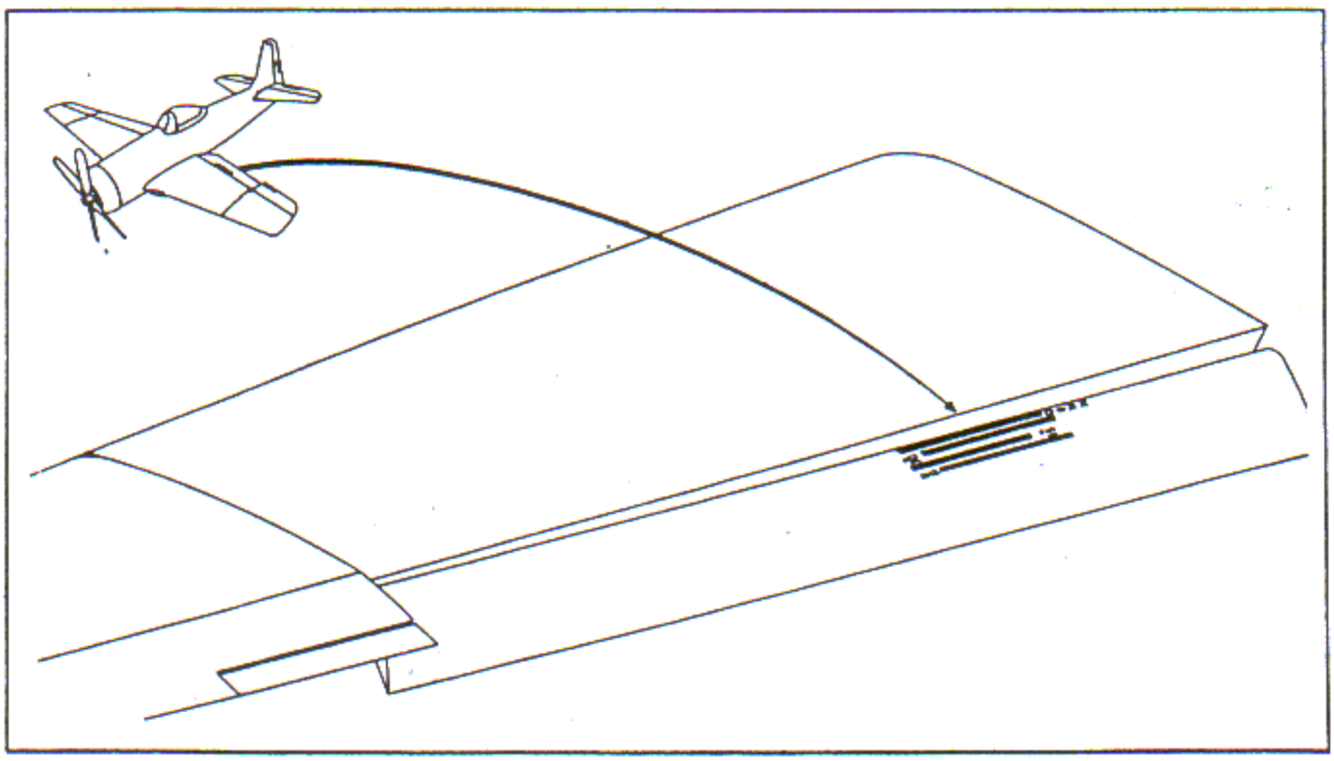


Figure 8—Wing Flaps Position Indicator

5. FUEL SYSTEM.

a. FUEL SPECIFICATION.—AN-F-48, Grade 115/145.

b. TANKS AND CAPACITIES.—The normal fuel supply is carried in a single pressurized 185 US. gallon self-sealing cell, located beneath the cockpit floor. A 150 gallon droppable tank can be installed on the fuselage bomb rack and a 100 gallon droppable tank on each wing bomb rack.

TANK CAPACITIES

Tank	*Gallons*
Main—Fuselage	185 US.
Droppable—Fuselage	150 US.
Droppable—Wing	100 US.

c. FUEL SYSTEM CONTROLS.

(1) FUEL QUANTITY GAGE.—Gage located on the fuel control panel. The pointer registers the number of gallons in the fuselage tank only.

(2) TANK SELECTOR VALVE CONTROL.—The tank selector valve control and dial are located on the fuel control panel.

(a) OPERATION.

Pointer DOWN to LEFT—fuel supply "OFF".

Pointer LEFT—"MAIN".
Pointer UP to LEFT—"FUSE DROP".
Pointer UP to RIGHT—"L WING DROP".
Pointer RIGHT—"R WING DROP".

CAUTION

Be certain pointer is centered on selected tank.

1. When the main tank is selected, fuel flows from it to the selector valve, auxiliary fuel pump, strainer, engine pump and carburetor. When a droppable tank is used, the flow will be direct to the selector valve and follow the above path, except that fuel at the rate of (approx) 30 gallons per hour will be transferred automatically from the strainer to the main tank. See paragraph (4) FUEL TRANSFER SYSTEM below.

(3) AUXILIARY FUEL PUMP.—The auxiliary fuel pump switch is located on the fuel control panel.

(a) OPERATION.

Switch RIGHT—Pump "ON".
Switch LEFT—Pump "OFF".

1. The pump is located in the fuselage below and aft of the fuel cell and acts as a booster for the engine driven pump, and as an emergency pump in the event of failure of the engine driven fuel pump. Operate the auxiliary pump to build up fuel pressure

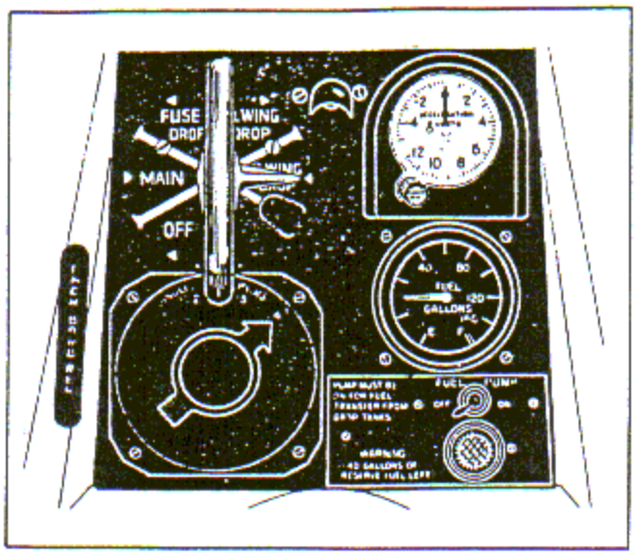


Figure 9—Fuel Control Panel

for starting the engine and to boost the engine driven pump during critical periods of fuel system operation such as:

a. During take off, landing or a rapid climb.

b. When using main tank between 5000 and 10000 ft (the main tank is pressurized above 9000 ft) particularly in warm climates or during a rapid climb.

c. When using droppable tanks above 3000 ft particularly in warm climates.

d. When shifting tanks.

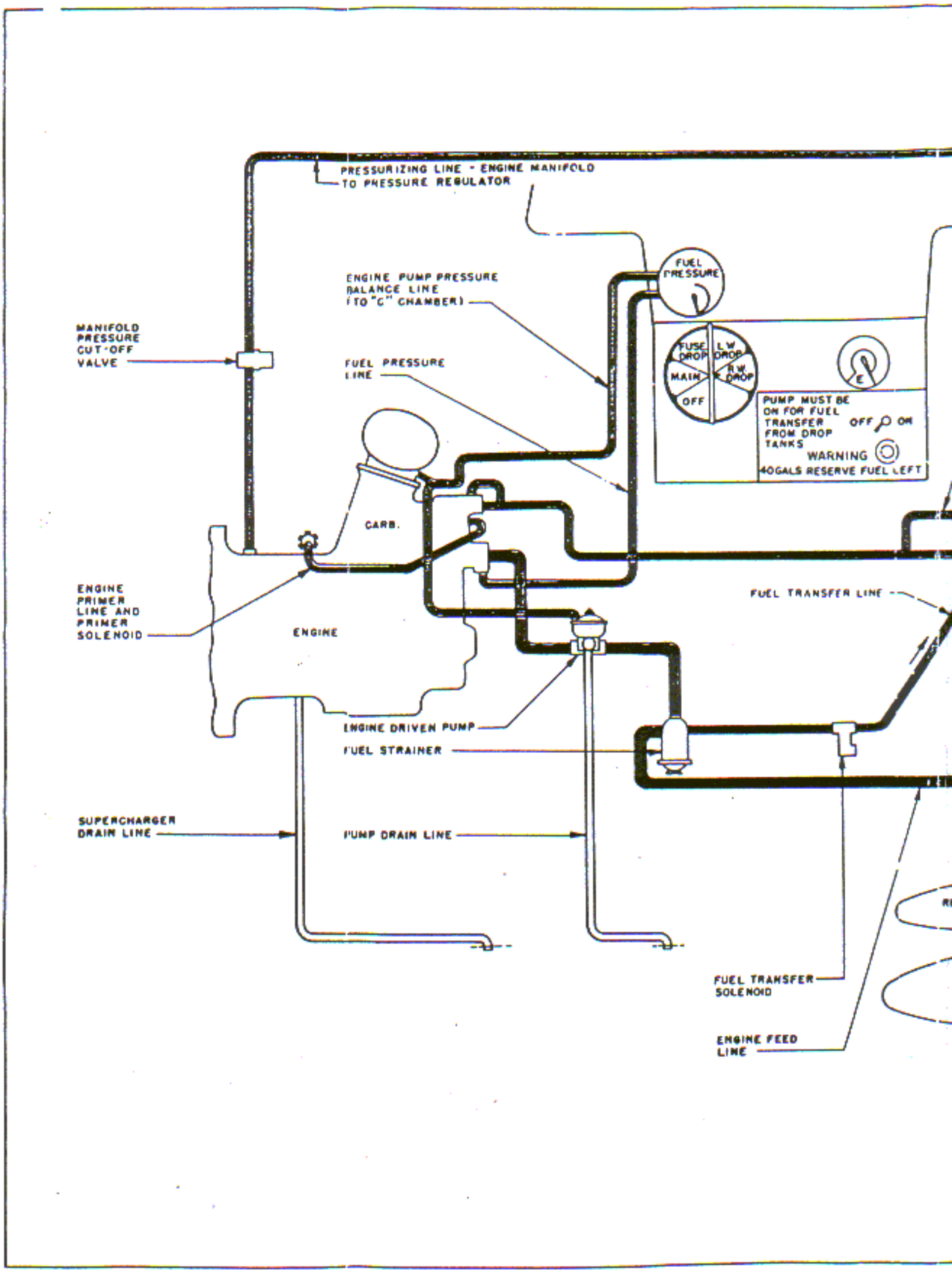
e. When engaging in maneuvers likely to involve diving or negative g accelerations.

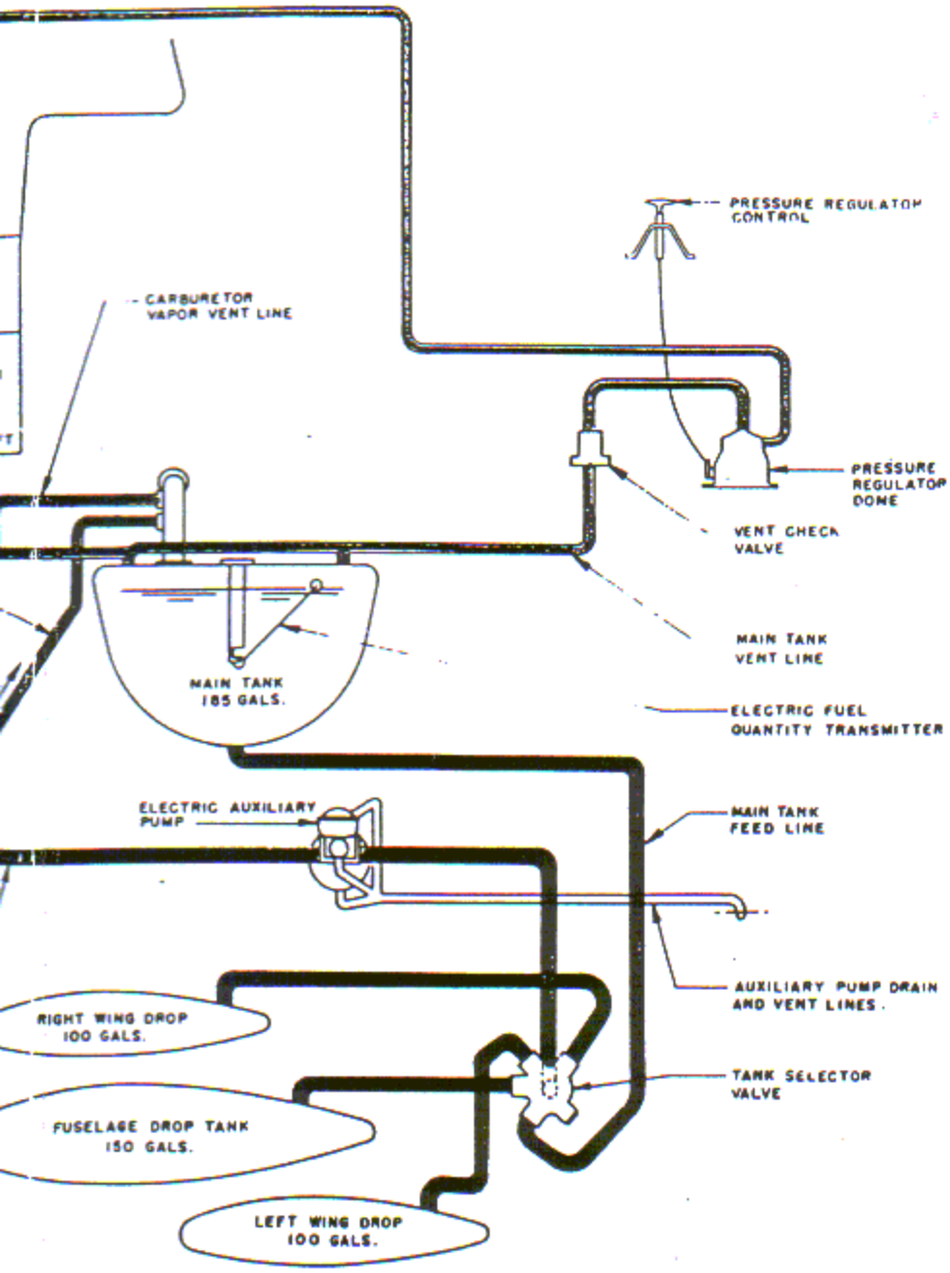
CAUTION

If the fuel system becomes locked with air or vapor, approximately 90 seconds may be required to restore normal operation without using the auxiliary fuel pump. Use of the auxiliary pump not only minimizes occurrence of vapor lock but appreciably reduces the time required for recovery if it is encountered.

(4) FUEL TRANSFER SYSTEM.

(a) GENERAL.—The fuel transfer system replaces fuel consumed from the main tank with that from any selected droppable tank. The fuel transfer solenoid valve is energized through a cam on the fuel tank selector valve when any droppable tank position is selected. This solenoid valve opens for fuel transfer only when all three of the following conditions are in effect, thus completing the electrical circuit.


PRESSURIZING LINE - ENGINE MANIFOLD TO PRESSURE REGULATOR
FUEL PRESSURE
ENGINE PUMP PRESSURE BALANCE LINE (TO "C" CHAMBER)
MANIFOLD PRESSURE CUT-OFF VALVE
FUEL PRESSURE LINE
FUSE DROP
L.W. DROP
MAIN
R.W. DROP
OFF
PUMP MUST BE ON FOR FUEL TRANSFER FROM DROP TANKS
OFF
ON
WARNING
40GALS RESERVE FUEL LEFT
CARB.
ENGINE PRIMER LINE AND PRIMER SOLENOID
ENGINE
FUEL TRANSFER LINE
ENGINE DRIVEN PUMP
FUEL STRAINER
SUPERCHARGER DRAIN LINE
PUMP DRAIN LINE
FUEL TRANSFER SOLENOID
ENGINE FEED LINE



NOTES

1.

TANK USE SEQUENCE

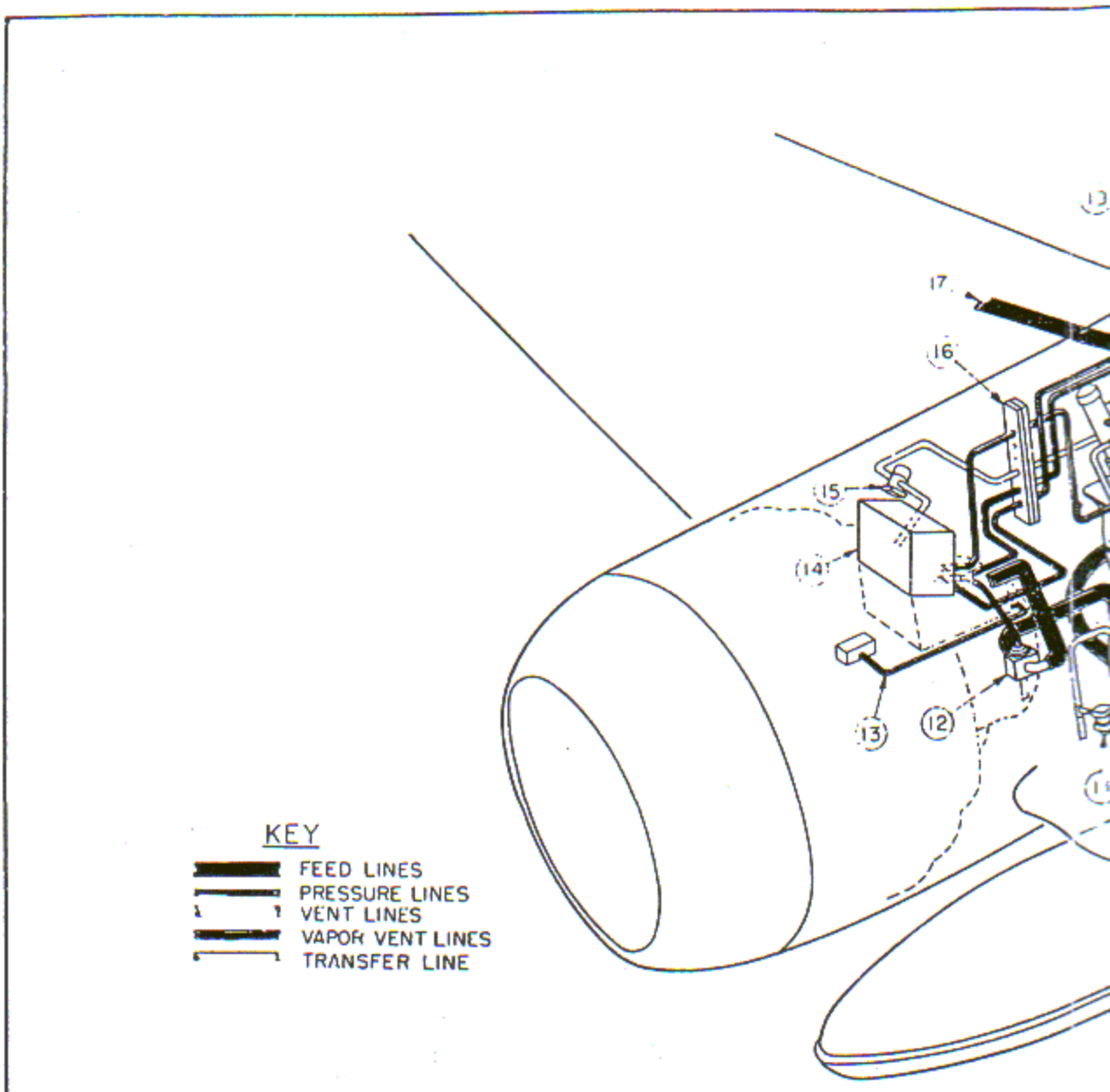
A. Main For Take-Off
B. Wing Droppable
C. Fuselage Droppable
D. Main For Landing

2.

USE AUXILIARY FUEL PUMP

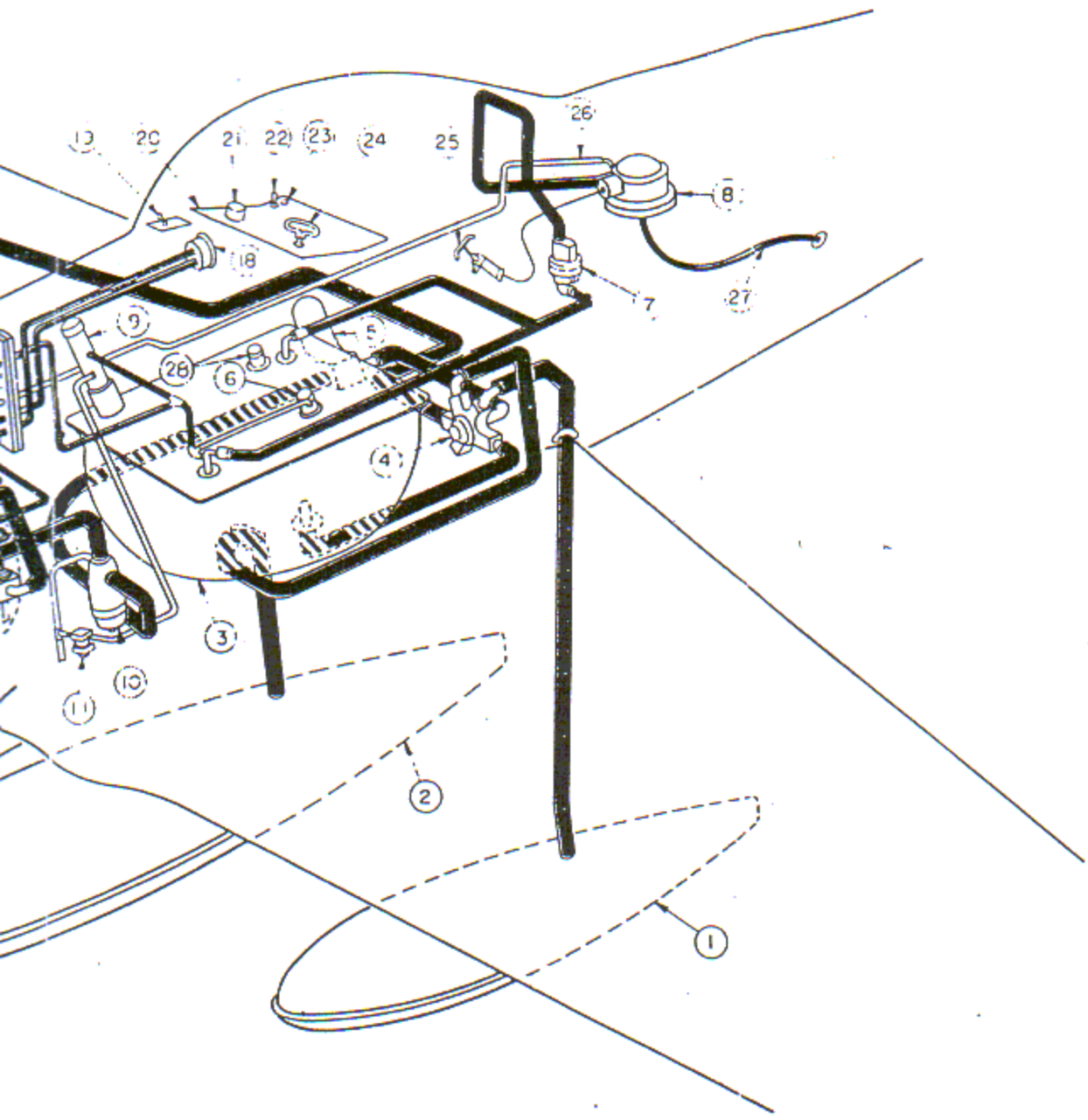
A. Starting
B. Take-Off
C. When Switching Tanks
D. At Altitude
E. Landing
F. Refer to section I, para 5.c.(3), for further operational information

Figure 11—Fuel System Control Diagram



1. 100 Gal Wing Droppable Tank
2. 150 Gal Fuselage Droppable Tank
3. Main Tank
4. Tanks Selector Valve
5. Auxiliary Fuel Pump
6. Fuel Transfer Switch
7. Vent Line Check Valve
8. Pressure Regulator Dome
9. Main Tank Fillerneck
10. Fuel Strainer and Drain Valve
11. Fuel Transfer Solenoid
12. Engine-driven Fuel Pump
13. Engine Primer Line & Solenoid
14. Carburetor Header (R-2800-34W engine has a down draft carburetor and R-2800-30W engine has an up draft carburetor.)
15. Manifold Pressure Cut-off Valve
16. Quick Disconnect Block Assembly
17. Feed Line from Right Wing Drop Tank
18. Fuel Pressure Gage
19. Primer Switch
20. Fuel Control Panel
21. Fuel Quantity Gage
22. Auxiliary Fuel Pump Switch
23. Fuel Pressure Warning Light
24. Tank Selector Valve Control
25. Pressure Regulator Control Handle
26. Tank Pressurizing Line to Manifold Cut-off Valve
27. Pressure Regulator Drain Line
28. Fuel Quantity Transmitter

Figure 10—Fuel System Diagram



Valve

1. Any droppable tank is selected.

2. Fuel level in the main tank drops below 184 gallons.

3. Auxiliary fuel pump is turned "ON" manually.

(b) Any deviation from these conditions automatically breaks the circuit, closing the solenoid valve and stops the fuel transfer from functioning. When the main tank fuel level rises to 184 gallons, the system will stop transferring automatically.

Note

On airplanes, serial No. 90437-90459 incl., and 94752 and 94753, the fuel transfer system is non-operative.

(5) TANK PRESSURIZING SYSTEM. — The pressure dome for the standard pressurizing system is located in the fuselage. The system maintains a pressure differential above atmospheric pressure at altitudes above 9000 feet, effected by a sylphon actuated by manifold pressure. Relief, regulator and cut-off valves are installed in the system. The manual override or cut-off valve control is a T handle located on the cockpit bulkhead, to the left of the seat.

(a) OPERATION.

PULL T handle to "RELEASE".
PUSH T handle for "PRESSURE".

CAUTION

Pull T handle to "RELEASE" pressure if tank is damaged.

(6) DROPPABLE TANKS.

(a) GENERAL.—Fittings for the installation of one fuselage and two wing droppable tanks are provided. The flow from these tanks is controlled by the fuel selector valve and the auxiliary fuel pump.

(b) ELECTRICAL CONTROLS. — The tank selector switches ("LEFT, BELLY and RIGHT") and the arming switch are located on the right armament switch panel. The release button is on the control stick grip.

(c) ELECTRICAL RELEASE.

1. Auxiliary fuel pump switch—"ON".

2. Fuel tank selector control—"MAIN".

3. R.P. and Bomb—Drop Tanks Switch—set to "BOMB—DROP TANKS". (This switch is installed in F8F-1 airplanes only.)

4. Bomb and Tank Selector Switch—"ON" selected tank or tanks.

5. Armament master switch—"ON".

6. Press bomb button on stick grip.

(d) MANUAL RELEASE.—The fuselage and wing droppable tanks can be released manually by pulling T handles located on the cockpit floor at each side of the pilot's seat.

(7) MAIN TANK WARNING LIGHT. — The fuel level warning light is on the fuel control panel. This light illuminates when the fuel quantity transmitter float, in the main tank, falls to the 40 gallon level. The quantity gage should be watched closely and the airplane operated at the most economical speed tactically feasible.

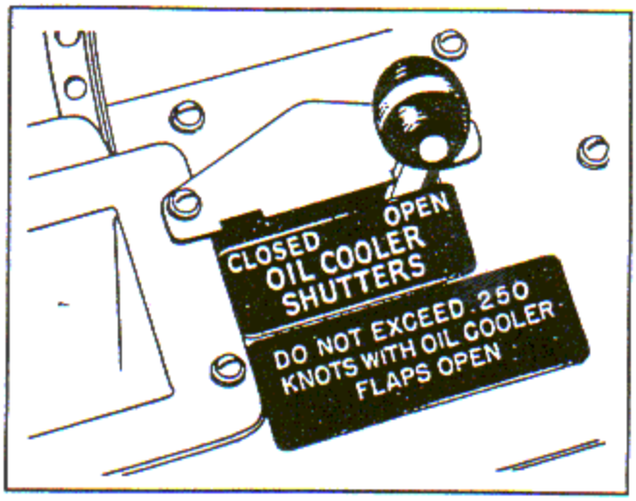


Figure 12—Oil Cooler Shutters Control

6. OIL SYSTEM.

a. OIL SPECIFICATION. — AN-O-8, Grade 1100 or 1120.

b. TANK AND COOLERS.

(1) GENERAL.—The aluminum alloy tank, located in the upper part of the engine accessory compartment, has a capacity of 17 gallons with three gallons expansion space.

Note

On the F8F-2 series airplanes, the oil tank is pressurized to approx 4 psi in order to insure proper oil pressure at altitude.

(a) The cooling air for the two oil coolers, connected in series, is taken through the left and right inboard wing leading edge ducts. Hydraulically operated air exit duct shutters are located on the bottom of the fuselage aft of the coolers.

c. OIL SYSTEM CONTROLS.

(1) GENERAL.—The oil cooler air exit duct shutters two position control lever is located on the top of the left hand shelf. The duct outlets and shutters, left and right, are located on the bottom of the fuselage just forward of the firewall. These shutters should be operated in conjunction with the engine instruments.

(2) OPERATION.

Lever FORWARD to "OPEN".
Lever AFT to "CLOSED".

CAUTION

Do not exceed 250 knots IAS with the oil cooler shutter "OPEN".

d. OIL DILUTION SYSTEM (AIRPLANE SER No. 94754 AND SUBSEQUENT).—The control switch for the operation of the oil dilution system is located on the electrical distribution panel just outboard of the starter switch. For oil dilution procedure, refer to Section VI, para 1.*n*.

7. HYDRAULIC SYSTEM.

a. GENERAL.—Pressure for the hydraulic system, operating the landing gear, wing flaps, dive recovery flaps, gun chargers, and oil cooler shutters, is normally supplied by the engine driven hydraulic pump. A hand pump system is installed for auxiliary operation, when the engine pump is not operating. The fluid reservoir, filter, system accumulator, unloader valve and system relief valve are located in the engine accessory compartment.

b. OPERATION.—The main pressure line, from the distribution unit, runs to the hand pump selector valve, from which pressure is supplied to the selector valves of the various systems. The hand pump selector valve handle *MUST* always be left on the "SYSTEM" position for operation of the system by the engine driven hydraulic pump. Return lines from the various selector valves run back to the hydraulic reservoir in the accessory compartment.

(1) The hydraulic system normal operating pressure is 1250-1500 psi until some circuit is operating, at which time the pressure drops until the operation is completed. The system pressure gage is located on the forward end of the left hand shelf. Hydraulic fluid specification is AN-O-366 (red color).

Note

When the hand pump selector valve control is set at "SYSTEM" and the engine driven pump is operating, if the pressure gage indicator falls below approx 1250 psi, malfunctioning of the pump is indicated. Any circuit may be checked for malfunctioning by observing the gage while moving the selector valve control from one setting to another. When this control is not being used for operating one of the units, keep it at "SYSTEM".

c. HAND PUMP SYSTEM.—This system consists of the hydraulic hand pump and the three position—"SYSTEM", "WING FLAPS", and "LANDING GEAR"—hand pump selector valve handle, both located to the right of the seat. If the engine driven hydraulic pump is not operating, turn the selector handle to the system to be operated then operate the hand pump. When the hand pump is not being used, set the handle on "SYSTEM". The "SYSTEM" position is used for operating the oil cooler shutters, dive recovery flaps, and gun chargers.

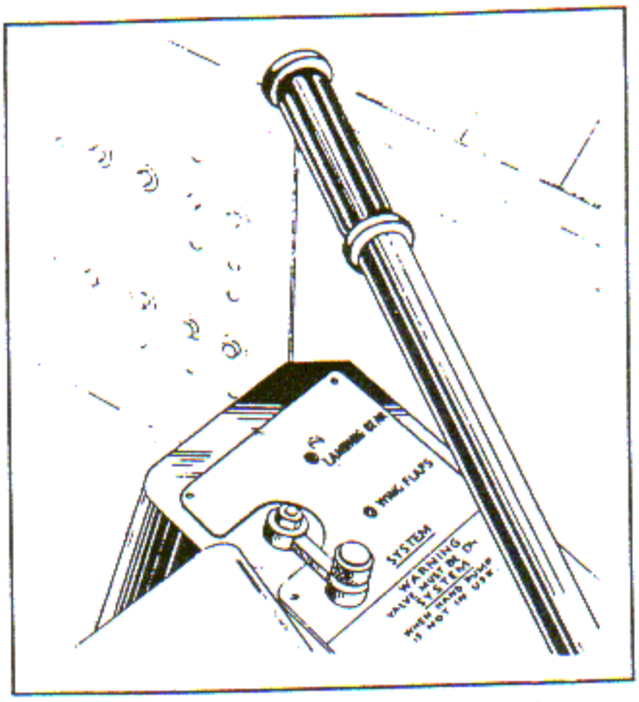


Figure 13—Hydraulic Hand Pump and Selector Control Lever

CAUTION

When the hand pump is not being used, keep the valve handle on "SYSTEM" or hydraulic units will malfunction.

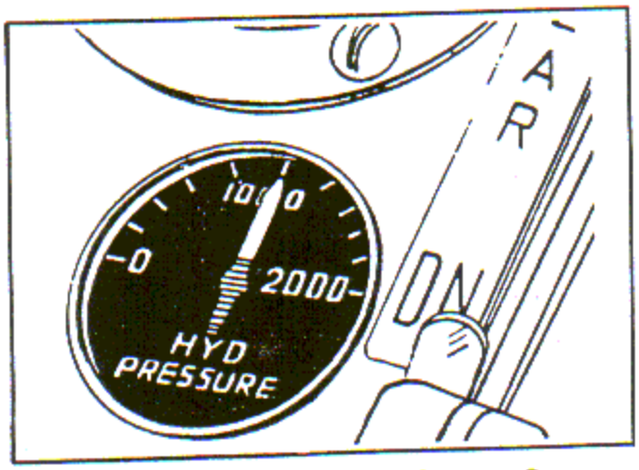


Figure 14—Hydraulic System Pressure Gage

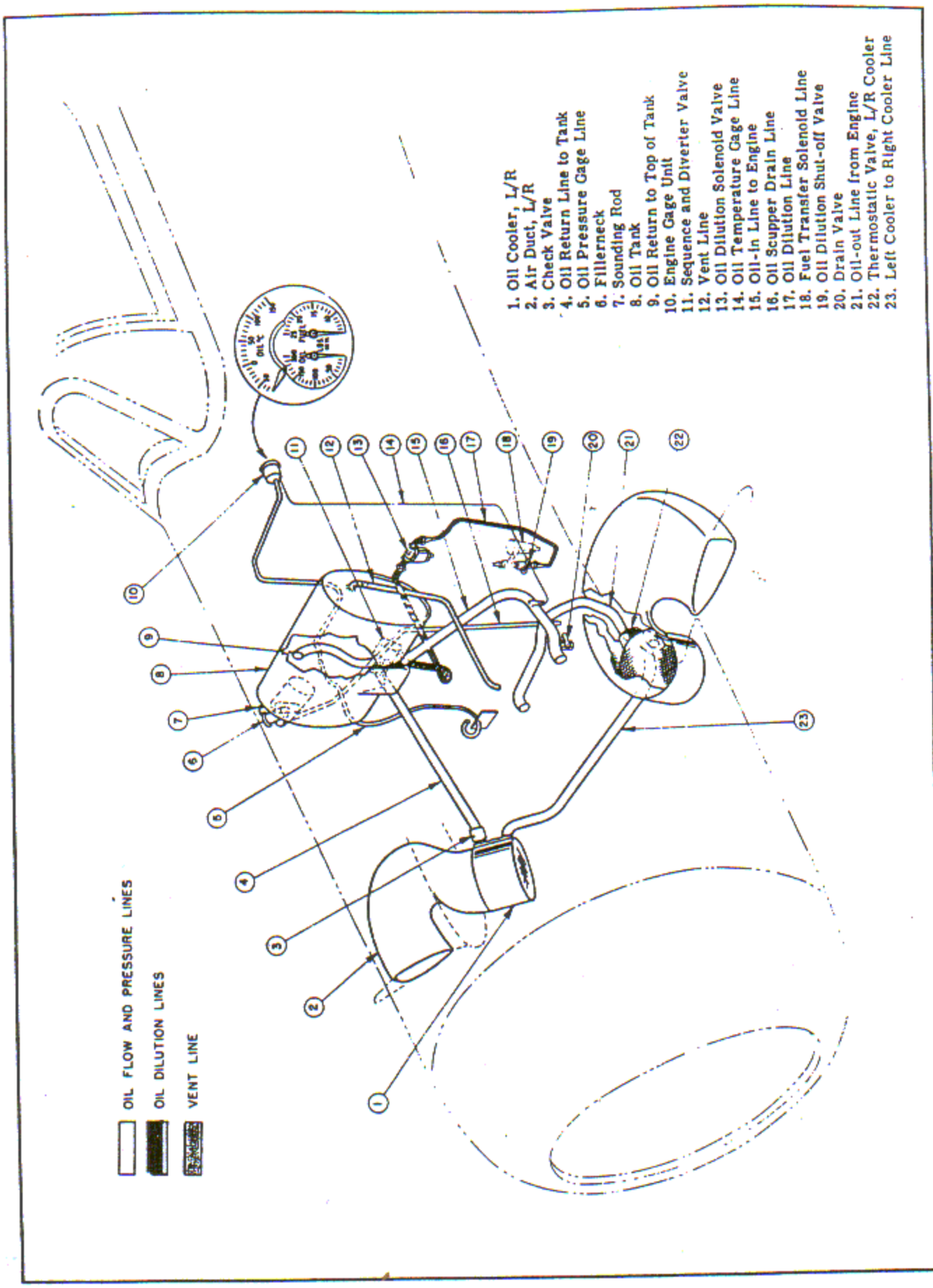


Figure 15—Oil System Diagram

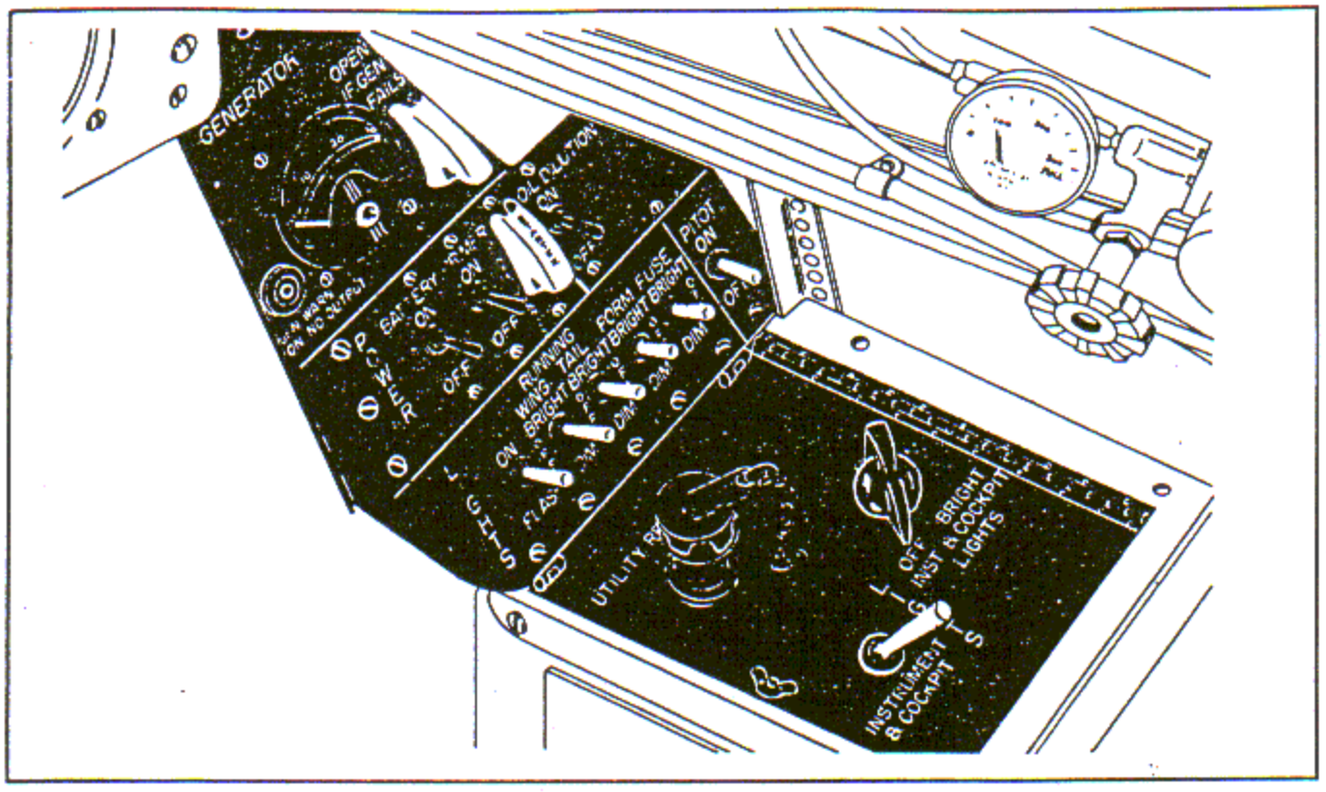


Figure 16—Electrical Switch Panel

8. ELECTRICAL SYSTEM.

a. GENERAL.—Power for the 28 volt electrical system is supplied by the engine driven generator. The generator circuit is equipped with a reverse current cut-out and voltage regulator. When the generator is not operating, power is supplied by a 24 volt, 17 ampere-hour battery mounted on a shelf in the fuselage aft of the pilot's bulkhead.

b. SYSTEM UNITS.—The following units are operated electrically:

Flight instruments
- Tachometer
- Compass
- *Attitude gyro
- *Directional gyro
- *Turn and bank

Oil-in temperature gage
Fuel quantity gage
Auxiliary fuel pump
Fuel transfer system
Oil dilution system
Starter
Primer
Pitot tube heater
Water injection system
Cowl flaps
Landing gear position indicator
Armament controls

Note

*In the F8F-1N and F8F-2N airplanes vacuum operated control units of the automatic pilot are installed in place of the electrical attitude gyro and directional gyro indicators. In the F8F-2 and -2P airplanes a vacuum operated gyro horizon indicator is installed in place of the electrical attitude gyro indicator. Late model F8F-1B and F8F-2, -2N and -2P airplanes are equipped with a vacuum operated turn and bank indicator.

c. DISTRIBUTION BOX AND CONTROLS.

(1) GENERAL.—The distribution box is located on the right hand side of the cockpit. The following controls and instruments are on the distribution box panels and the pilot's switch panel which is at the forward end of the box. All the controls are identified and their operations indicated on the adjacent nameplates.

(a) The top panel contains a rheostat which controls the cockpit lights and one controlling the main instrument panel lights. The lights are extinguished by turning the rheostat knobs to their full counterclockwise positions.

(b) A panel receptacle is provided for the attachment of an electrically heated pilot's suit.

(c) Inboard panel contains the reset circuit breakers, their reset buttons protruding through the panel. The circuit breakers protect the various circuits from sustained overloads.

Note

If the circuit reset button for any electrical equipment that fails to operate has "popped out", push the button in again to restore power.

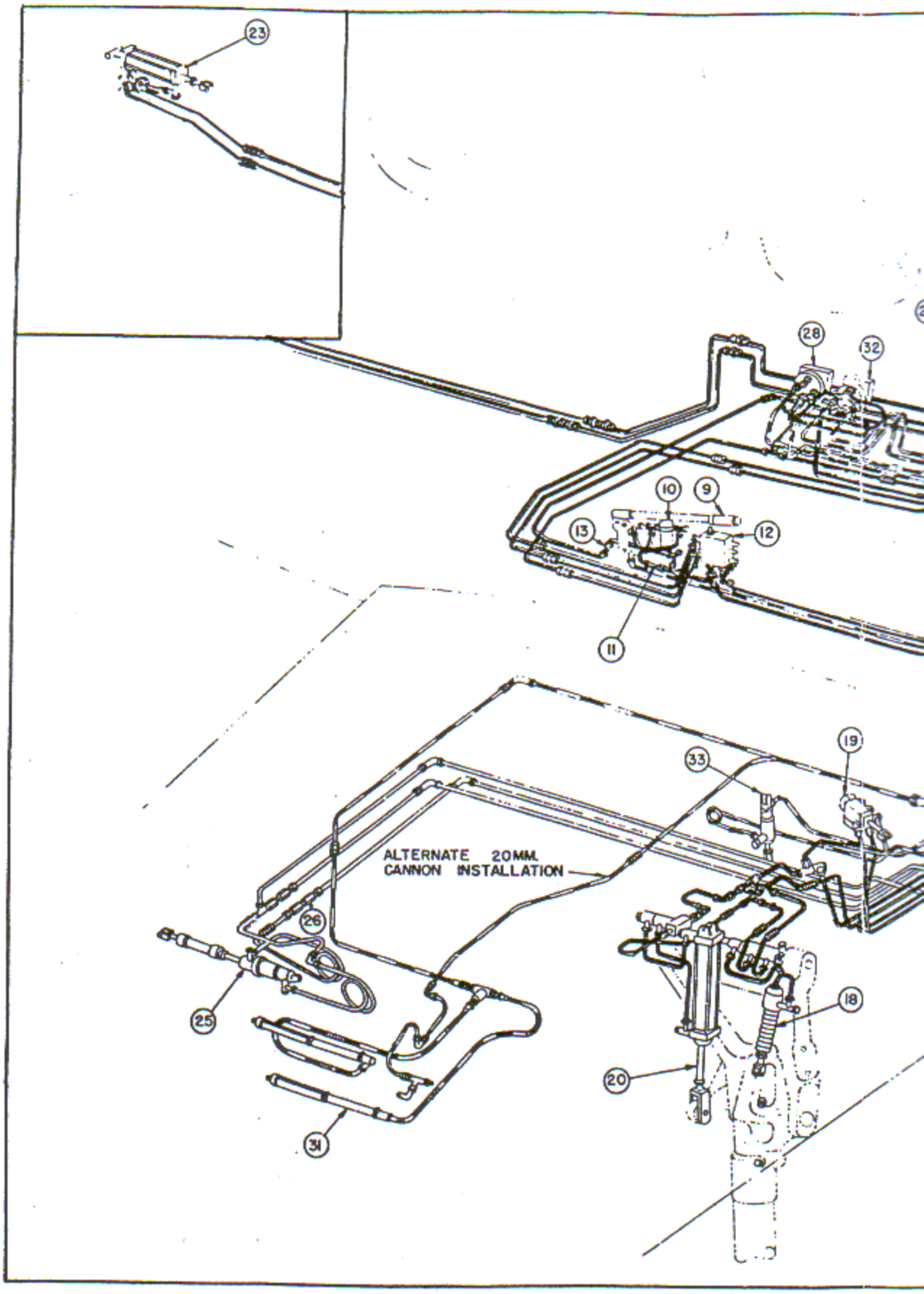
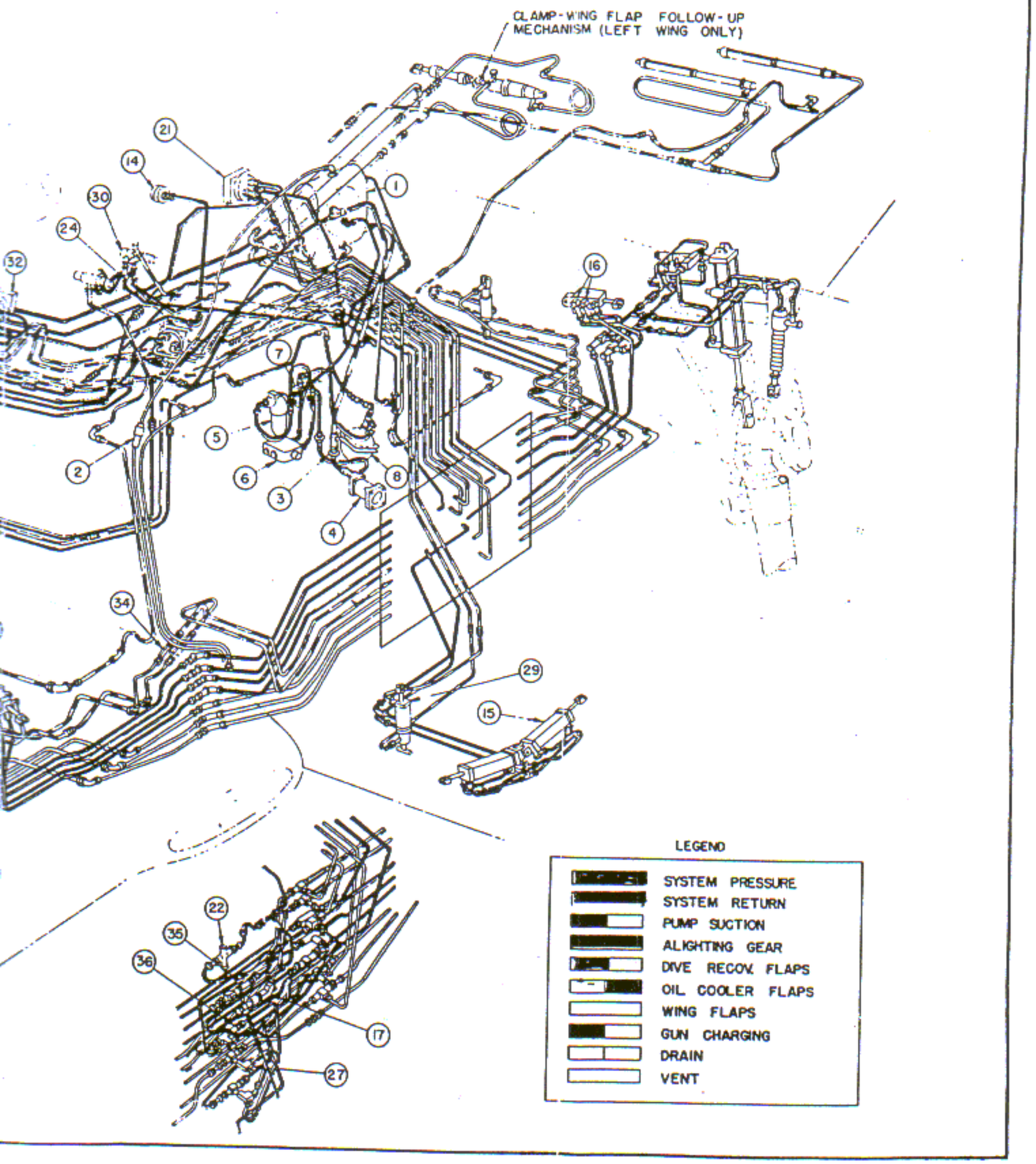


Figure 17—Hydraulic System Diagram


CLAMP-WING FLAP FOLLOW-UP MECHANISM (LEFT WING ONLY)
21
14
30
24
32
1
16
7
5
2
6
3
8
4
34
29
15
22
35
36
17
27
LEGEND
SYSTEM PRESSURE
SYSTEM RETURN
PUMP SUCTION
ALIGHTING GEAR
DIVE RECOV. FLAPS
OIL COOLER FLAPS
WING FLAPS
GUN CHARGING
DRAIN
VENT

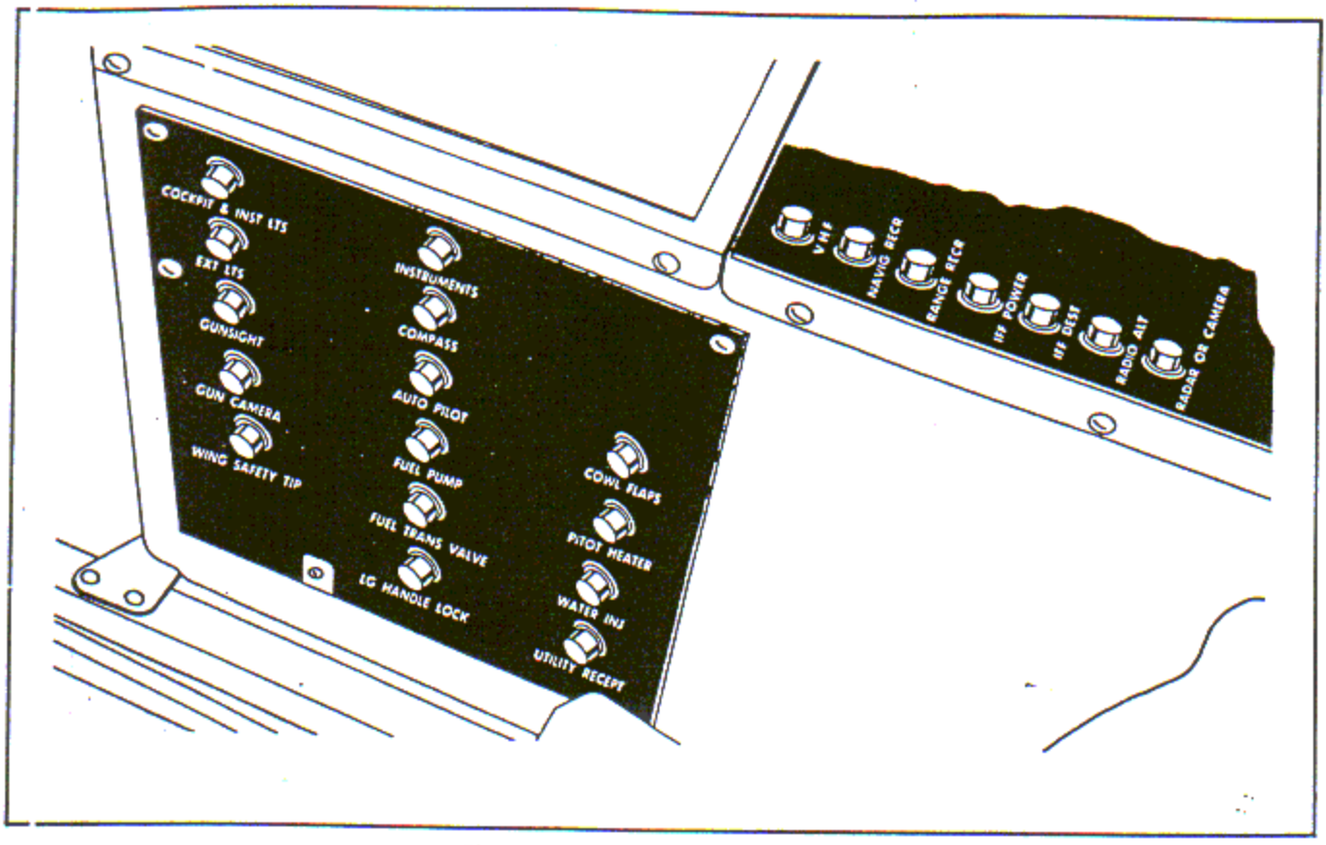


Figure 18—Circuit Breaker Panel

(d) Pilot's switch panel contains the following control switches:

Battery	Exterior lights master
Primer	Running lights
Starter	Formation lights
Pitot tube heater	Tail light
Oil dilution	Section lights

(2) LIGHTS.—The exterior lights master switch must be "ON" for the exterior lights to function—running, formation and section. The exterior lights control switches may be placed on either "BRIGHT" or "DIM".

(a) The wing and tail lights are controlled by one switch—"DIM", "BRIGHT" or "OFF". One switch controls both formation lights and one switch, the section light. Neither of these switches has an OFF position and can only be placed on "DIM" or "BRIGHT". They will function only when the Formation Section switch is placed on "STEADY" or "FLASH" for code signalling operation.

Note

Late model airplanes have a separate tail light switch.

(3) GENERATOR CONTROLS. — A generator voltmeter indicating the voltage output of the generator and a generator emergency switch are located on the distribution panel. This switch enables the pilot to cut out the generator when it is malfunctioning. The generator emergency switch should be left on at all times except as directed in Section IV.

CAUTION

A voltage range of 27.5-28.5 should show on the voltmeter for proper functioning of the electrical equipment.

(4) EXTERNAL POWER RECEPTACLE.—An external power receptacle is on the right hand side of the fuselage aft and below the wing. External power should be used to start the engine and also to operate the electrical units which are being checked.

9. AUXILIARY CONTROLS.

a. LANDING GEAR CONTROL.

(1) GENERAL.—The landing gear (main and tail wheels) is raised and lowered by operating the two position wheel shaped control handle, with safety catch, located adjacent to the front of the left hand shelf. On airplanes serial No. 95029 and subsequent, an automatic locking solenoid has been installed to prevent accidental retraction while the airplane is on the ground.

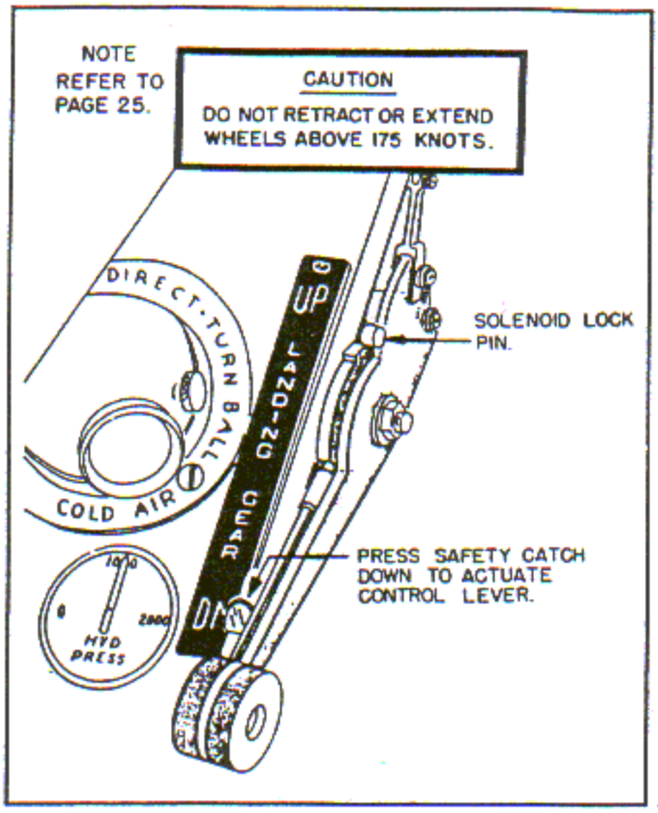


Figure 19—Landing Gear Control

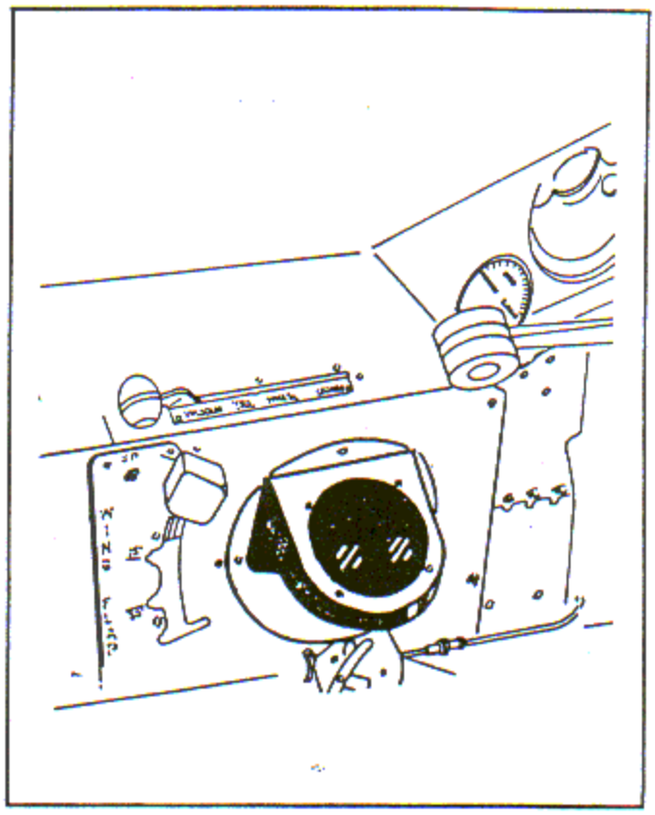


Figure 20—Landing Gear Indicator

(2) OPERATION.

To lower wheels—move lever "DOWN" until locked. Insure that the control handle is locked in the DOWN position by attempting to pull the lever up against the locking plunger after the position indicator indicates the gear is fully down and locked.

To raise wheels—pull safety catch and move lever "UP".

(3) For emergency operation of the landing gear, refer to Section IV, paragraph 6.

(4) POSITION INDICATOR.—The landing gear position indicator is installed on the lower left hand side of the main instrument panel. F8F-1N and the F8F-2 series airplanes have the indicator located on the side of the left hand console.

(a) Wheels UP is indicated by the word "UP" appearing in each cut-out. Wheels DOWN is indicated by the black and white wheel appearing in each cut-out.

(b) When the battery switch is "OFF" or when the indicator circuit is not operating, red and white diagonal lines appear in each cut-out.

b. ARRESTING HOOK CONTROL.

(1) GENERAL.—The arresting hook is extended by operating the "T" handle control located on the floor to the left of the seat. The green light adjacent to the "T" handle illuminates when the hook is extended and locked. A switch is installed in the battery connector box for cutting in the approach light during simulated carrier landings.

(2) OPERATION.—The "T" handle should be pulled up approximately eight inches and released, repeating until the hook is fully extended and locked at which time the green light illuminates.

(a) The hook is stowed by the ground crew. Pull the down-lock release lever, on left hand side of tail cone, outboard and push hook into the fuselage.

c. WING FOLDING.

(1) GENERAL.—The outer panels are secured to the center section by four hinges. The upper fore and aft hinges are secured by bolts, and the lower fore and aft hinges by pins, capable of being withdrawn, permitting the outer panel to fold upward. Outer panel spreading and folding is accomplished manually.

(2) OPERATION.

(a) TO FOLD OUTER PANEL.

1. Unfasten hinge pin pulling mechanism access door.

2. Release catch holding lever handle and pull out lever to its full length. When lever is withdrawn, the visual indicator on the wing is raised one half inch.

3. Swing lever down and forward. This action withdraws the lower forward and aft hinge pins and raises the indicator to full height.

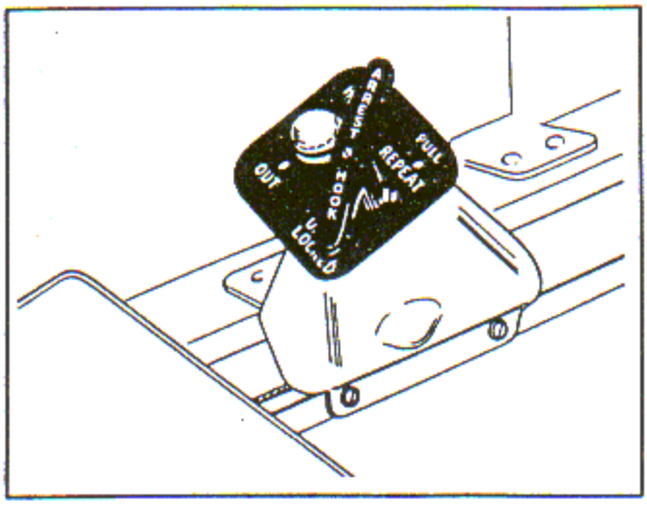


Figure 21—Arresting Hook Control

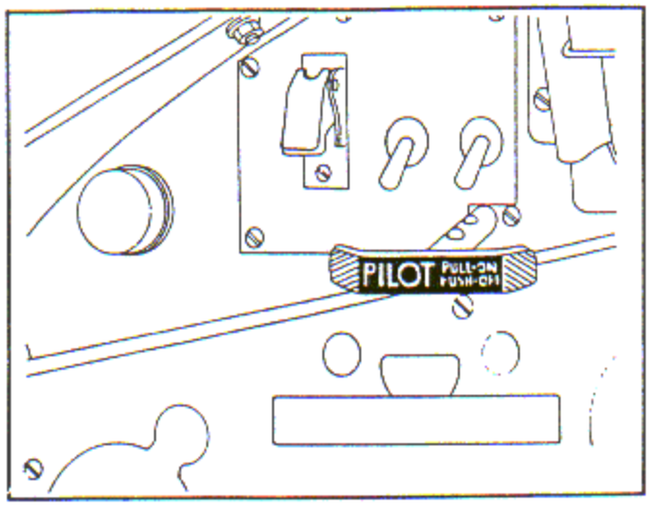


Figure 22—Automatic Pilot On-Off Control

4. To fold wing, insert wing folding bar (provided for the purpose) into the hole in the bottom surface of the outer panel. Remove bar when wing is folded. As the wing folds, a stop automatically moves in between the aft lower hinge plates to prevent locking of the hinge when the wing is in the folded position.

5. A spring loaded pin automatically moves into place in the outer panel hinge fitting as the panel reaches the folded position.

(b) TO SPREAD OUTER PANEL.

1. Insert bar in bottom surface of outer panel, release spring loaded lockpin and lower outer panel. (Late model airplanes are equipped with a cable and handle, adjacent to the folding lever, for releasing the lockpin.)

WARNING

Lower wing outer panel slowly and keep hands clear of the folding axis.

2. Swing handle aft and up. This movement locks the wing hinges, and partly drops the visual indicator on the wing.

3. Slide lever up into the wing until safety catch engages and locks lever handle in stowed position. The red warning indicator cylinder should be flush with the wing skin.

4. Fasten the hinge pin pulling mechanism access door.

d. AUTOMATIC PILOT.

(1) GENERAL. — The F8F-1N airplanes are equipped with the Type GR-1 automatic pilot. The GR-2, a redesign of the GR-1 is installed in the F8F-2N airplanes. This pilot is self-synchronous; that is, it may be engaged in any reasonable flight attitude, and will take over and maintain the airplane in the prevailing attitude until it is changed by means of the automatic pilot controller. This eliminates the necessity of adjusting knobs, or setting dials or pointers before or after engagements. The flight attitude limits of the pilot are as follows:

Dive—50°, Climb—30° and Bank—45°.

(2) CONTROLS.

(a) ON-OFF CONTROL HANDLE.—The automatic pilot is engaged and disengaged by the ON-OFF control handle installed under the left hand side of the main instrument panel. This handle has three positions: "ON", "OFF", and "CENTRALIZED". With the airplane battery switch turned to the "ON" position and the ON-OFF handle at (FULL IN) "OFF" position, the automatic pilot synchronizing system is operative. With the handle in the (MIDDLE) "ON" position, synchronization ceases for the bank and climb gyro units and the automatic pilot takes control and maintains the prevailing flight attitude. When the ON-OFF handle is pulled out and held (FULL OUT) in the "CENTRALIZED" position, the airplane returns to straight and level flight. With the GR-2 installation, a red warning light illuminates (on the instrument panel) whenever the handle reaches the "CENTRALIZER" position.

(b) CONTROLLER.—The automatic pilot controller is mounted forward, on the right hand cockpit rail. The operator can maintain a straight and level flight attitude by proper manipulation of the controller. Dives, climbs, banks, coordinated turns, and climbing and diving turns may be made by finger-tip operation of the lever. A set course may be maintained by momentarily depressing the controller button. The same results are obtained, by use of the controller, as when the conventional control stick and rudder pedals are used.

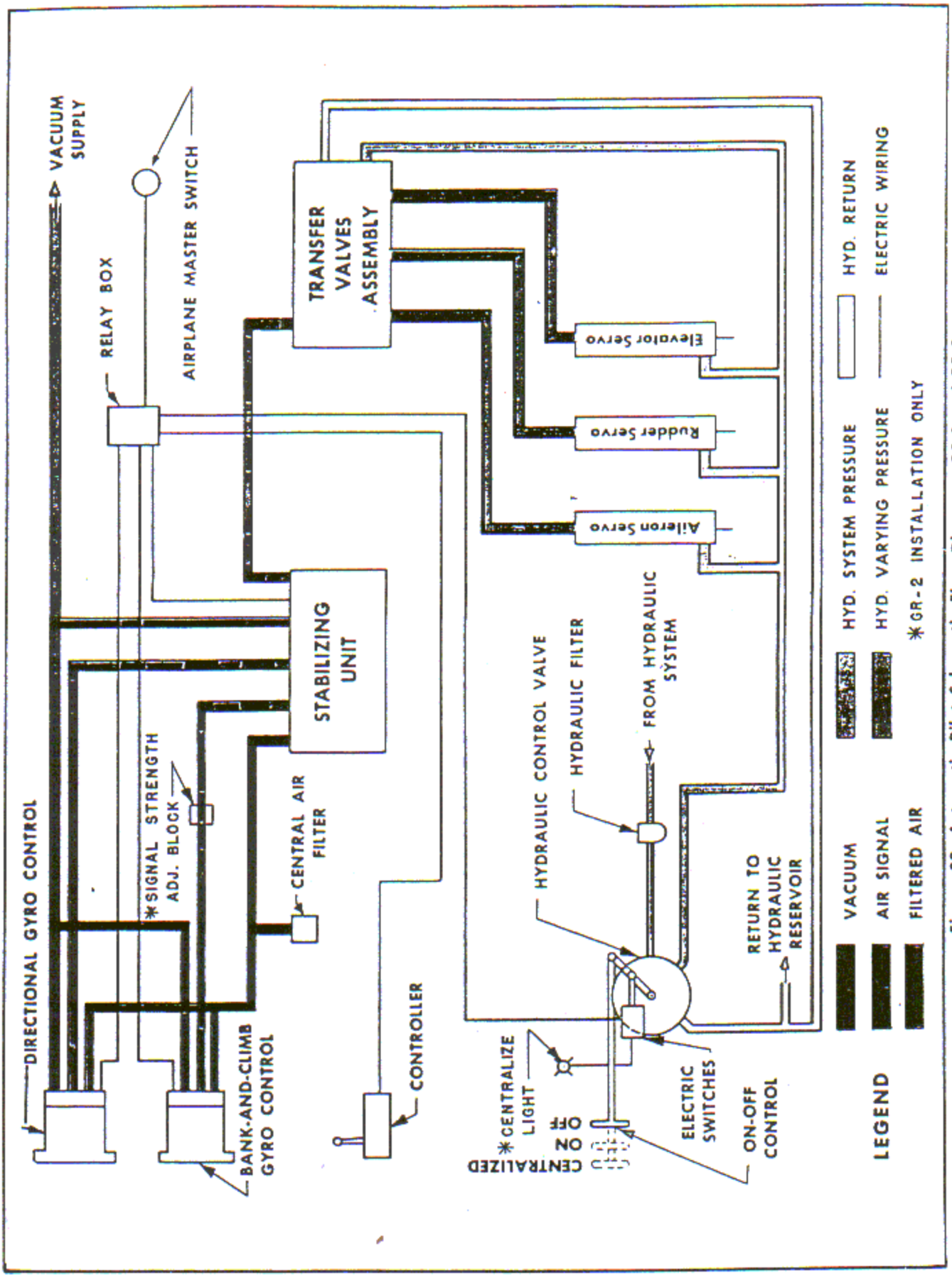


Figure 23—Automatic Pilot Schematic Flow Diagram—GR-1 and GR-2

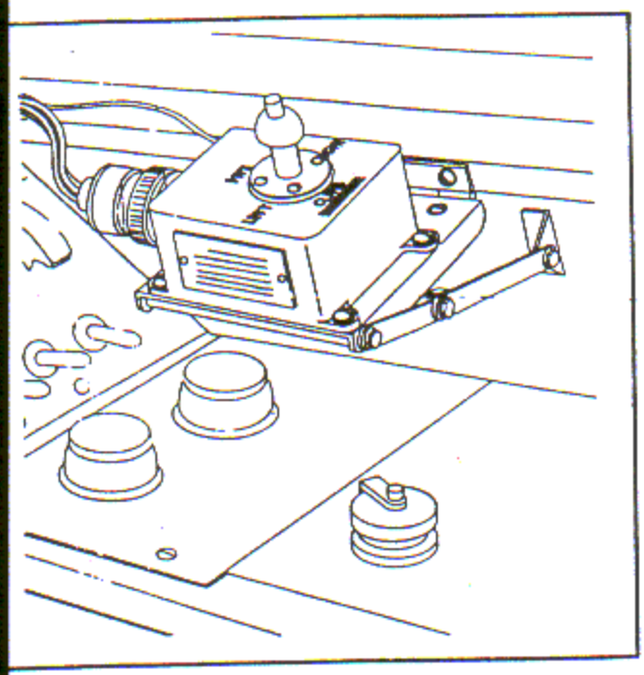


Figure 24—Automatic Pilot Controller

10. MISCELLANEOUS CONTROLS AND EQUIPMENT.

a. BUBBLE CANOPY.

(1) GENERAL.—The bubble canopy consists of a piece of moulded plexiglas attached to an aluminum alloy frame which is installed on the fuselage tracks by three rollers. A chain assembly, and torque tube and sprocket arrangement is operated by a handcrank which moves the canopy fore and aft. The hood is locked in any position by two positive cam locks in the handcrank box. The enclosure is locked in any intermediate position between open and closed by releasing the crank.

(a) When the hood is cranked to the "FULL OPEN" position a mechanical lock automatically snaps into place.

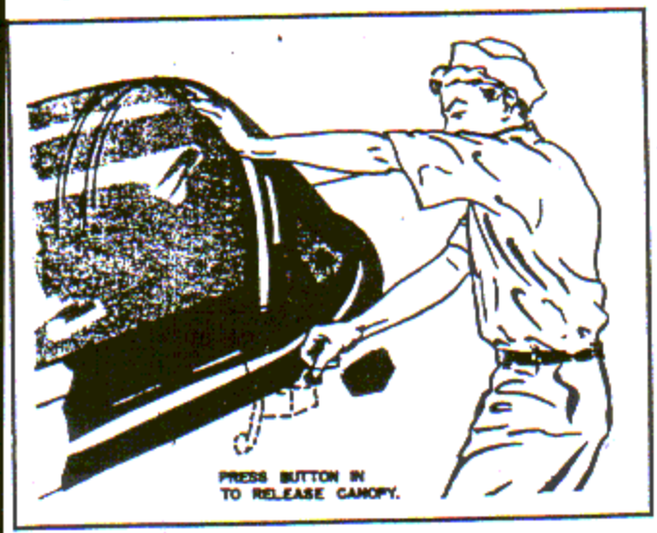


Figure 25—Outside Canopy Release

(2) OPERATION.

To "CLOSE" canopy, push the open lock-lever "FORWARD" and rotate the handcrank COUNTER-CLOCKWISE.

To "OPEN" canopy—Rotate handcrank CLOCK-WISE.

(a) The canopy may be opened or closed from the outside by pressing and holding (until the hood is full open or closed) the release button on the right side of the fuselage below the windshield.

(3) To jettison the canopy in an emergency, refer to Section IV, paragraph 4.

b. COCKPIT VENTILATORS.

(1) GENERAL.—A Thermotank Punkah Louvre is installed adjacent to the forward end of the left and right hand shelves. The cold air is taken from the oil cooler air ducts.

(2) OPERATION.—For cold air operate louvres as follows:

"TO OPEN" ventilator—TURN KNOB.

"TO DIRECT" the air—TURN BALL.

c. SURFACE CONTROLS LOCK.—To lock the control surfaces for parking the airplane, hook one end of cable to clip on control stick below pistol grip and connect the other ends to the holes in the rudder pedals. Buckle the safety belt after passing it over the top of the stick.

d. CHARTBOARD. — The pilot's chartboard is stowed against the skin on the right hand side of the cockpit.

e. MAPS AND COMPUTER HOLDER. — The holder is located on the left hand shelf. A leather strap is provided for securing the contents in the holder.

f. RELIEF TUBE.—The relief tube is stowed in a clip beneath the seat.

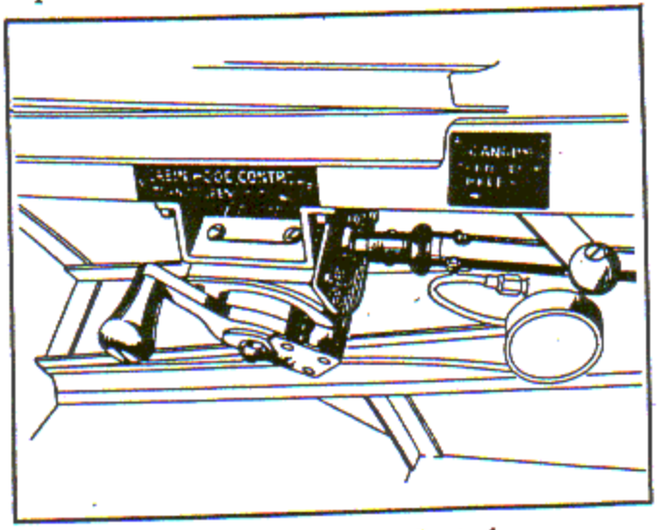


Figure 26—Canopy Control

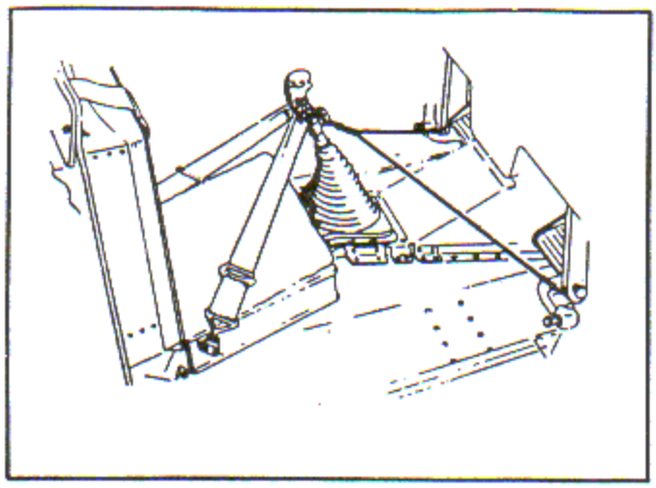


Figure 27—Surface Controls Lock

g. PILOT'S SEAT AND HARNESS.—A cushion is supplied to make minor adjustment for the fixed pilot's seat. The harness consists of a set of lap and shoulder straps. The shoulder straps are adjustable.

h. ANTI-BLACKOUT EQUIPMENT.—Provisions are made for the attachment of anti-blackout equipment in airplanes serial No. 94752 and subsequent. A quick-disconnect assembly for attachment of the anti-blackout suit is installed on the cockpit floor on the left hand side of the pilot's seat.

i. DEFOGGING SYSTEM. — On airplanes serial No. 94979 and subsequent, a defogging system has been installed. Warm air from the oil cooler ducts is routed to the windshield. A control handle is located to the right and above the main instrument panel. Turn straight up for "OPEN" and down for "CLOSED".

j. DEGREASING SYSTEM.—On F8F-1N and F8F-2N (night fighter) airplanes, a windshield degreasing system is installed. A tank, mounted in the engine accessory compartment, supplies fluid for the tube mounted on the forward side of the windshield. The primer control is installed to the left of the main instrument panel. Pull knob AFT several times to operate.

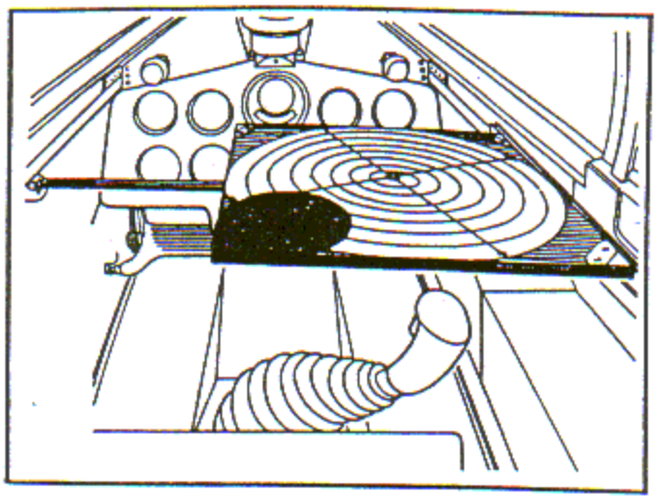


Figure 29—Chartboard

k. INSTRUMENTS.

(1) G-2 REMOTE COMPASS.

(a) GENERAL.—The G-2 compass combines the advantages of the remote compass and the gyro compass into one instrument, thus providing a stabilized gyro compass reading. It automatically corrects for drift and reduces oscillation and northerly turning error.

(b) A correspondence dial is located in the center of the master compass indicator. This dial gives an unstabilized remote compass reading. The outer dial of the master indicator gives a stabilized gyro compass heading free from drift. A selector switch, which provides automatic correction of the instrument or permits it to be used as a free directional gyro, is located to the left of the indicator.

(c) OPERATION.—The system operates when the battery switch is "ON". Allow sufficient time for the gyro motor to warm up. Place the control switch in the "COMPASS CONTROL" position. Push in the

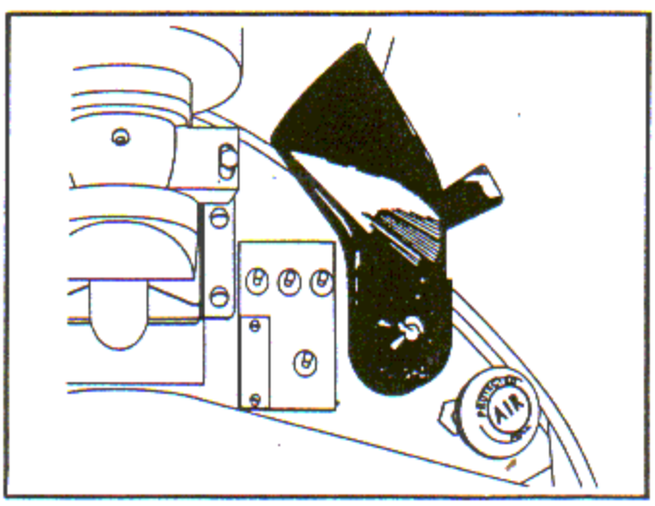


Figure 28—Defogging System Control

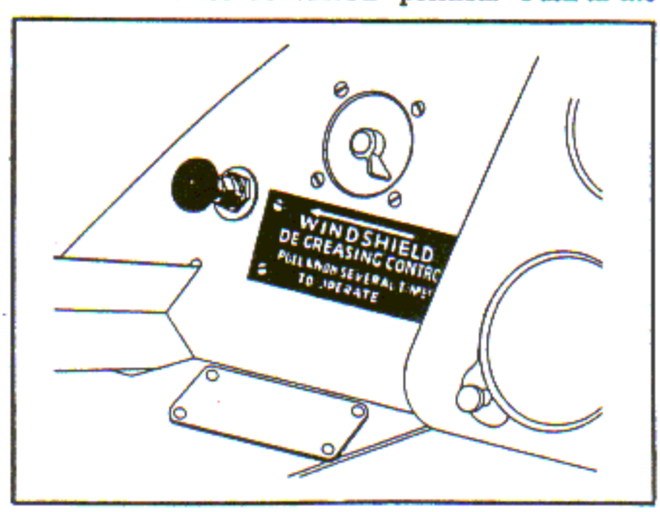


Figure 30—Degreasing System Control

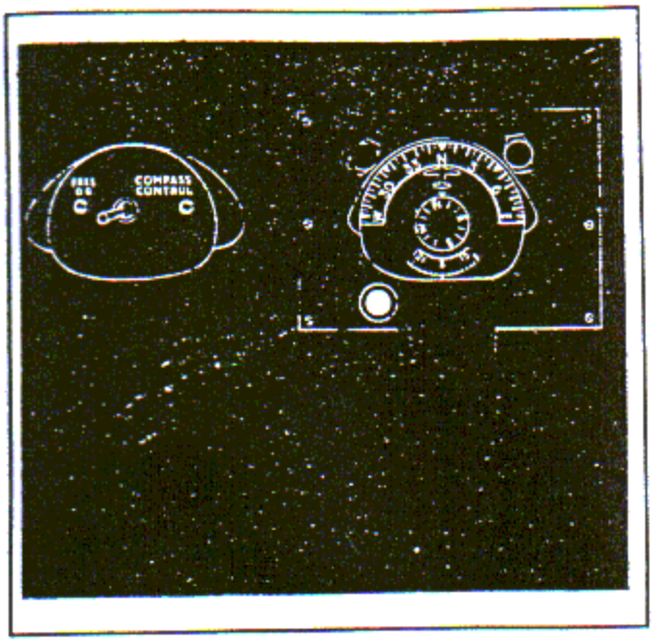


Figure 31—G-2 Compass Indicator

caging knob and rotate to establish the initial on course heading obtained from the correspondence indicator, then pull out the knob. The instrument will now correct any variation from the magnetic heading as shown by the correspondence indicator, at a rate of four degrees per minute. When flying near polar regions the instrument should be used as a free directional gyro. To return to compass controlled operation, place the selector switch in the "COMPASS CONTROL" position, then depress the caging knob, and reset the master direction indicator to the heading indicated by the correspondence indicator.

WARNING

Always operate the selector switch before setting the heading with the caging knob; otherwise damage will result.

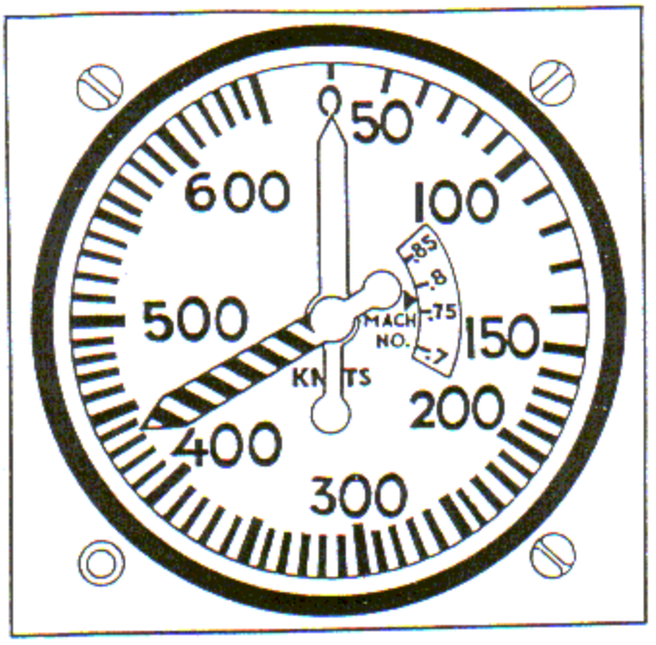
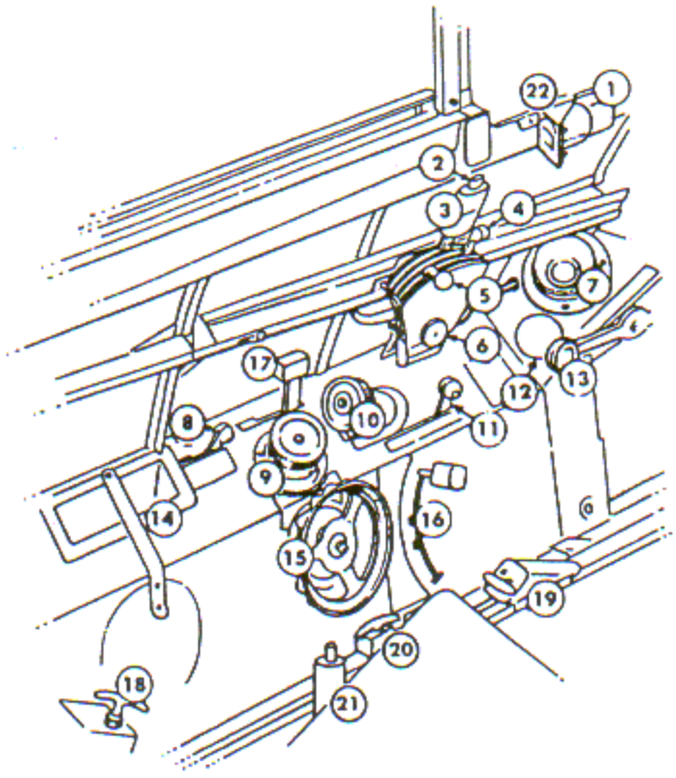
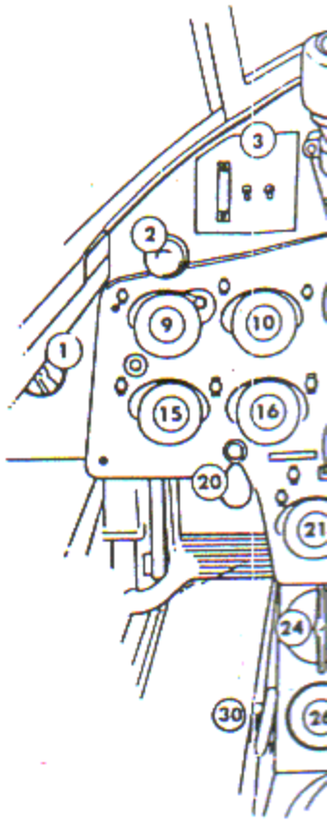


Figure 32—Airspeed Indicator

1. If the difference between the correspondence indicator and the gyro reading is large, several minutes will be required by the instrument before complete correction will take place. To eliminate this delay, the pilot may set the gyro and correspondence indicator together by turning the caging knob. Caging is not required during maneuvers.

(2) AIRSPEED INDICATOR. — An R88-I-473 Kollsman Airspeed Indicator is mounted on the instrument panel of later model F8F-2 airplanes. The white pointer gives standard airspeed readings and the red pointer shows the maximum indicated airspeed permissable. The latter is pre-set in accordance with the airplane limitations. This airspeed must not be exceeded. A small sub-dial on the right side of the indicator shows the Mach number corresponding to this critical airspeed. The red pointer moves with changes in altitude thus giving a corrected reading.





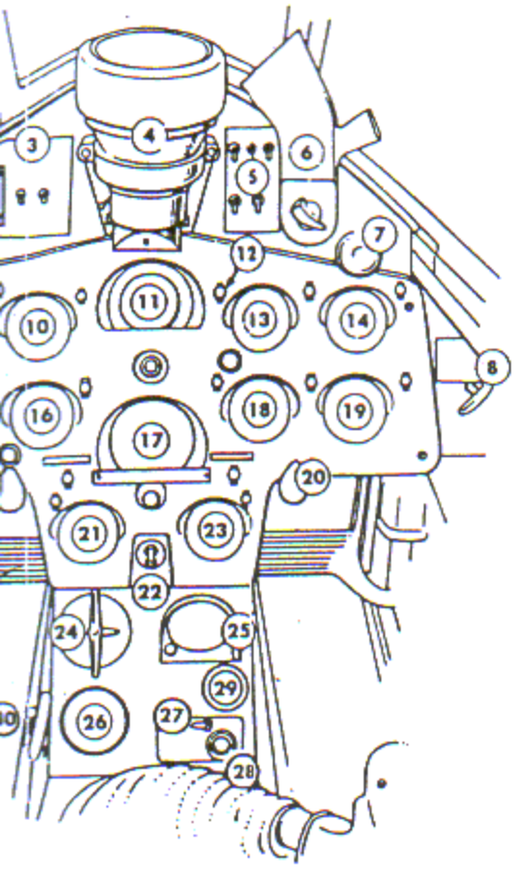
LEFT HAND VIEW

FORW

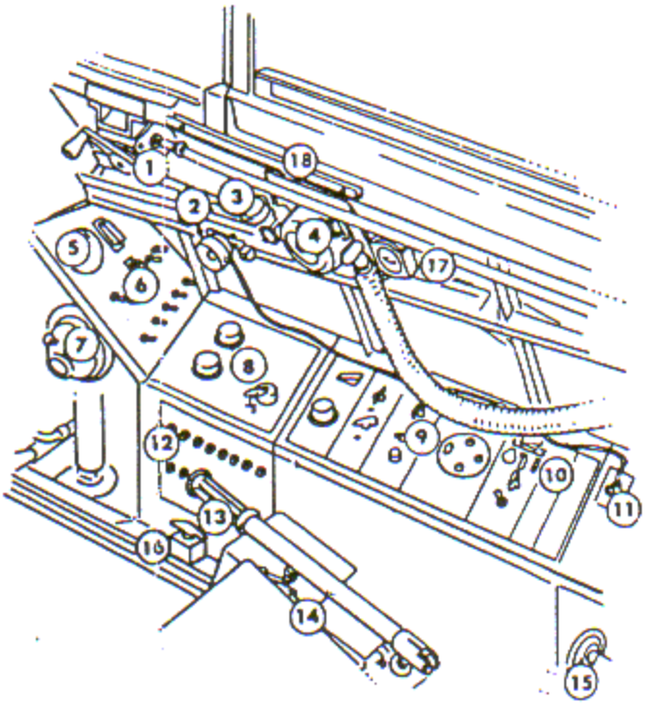
1. W.E.P. Switch
2. Microphone Switch
3. Throttle Control
4. Propeller Pitch Control
5. Mixture Control
6. Control Quadrant Friction Knob
7. Fresh Air Control
8. Oil Cooler Shutter Control
9. Rudder Trim Tab Control
10. Aileron Tab Control
11. Tail Wheel Lock Control
12. Hydraulic Pressure Gage
13. Landing Gear Control
14. Map Case
15. Elevator Trim Tab Control
16. Wing Flaps Control
17. Dive Recovery Flap Control
18. Fuel Pressurizing Control
19. Arresting Hook Control
20. Manual Bomb Release Control
21. Anti-Blackout Connection Fitting
22. Stand-By Compass

1. Ignition Switch
2. Supercharger Control
3. Armament Master and Gun Switches
4. Gun Sight
5. Bomb and Tank Selector Switches
6. Windshield Defogger
7. Carburetor Air Control
8. Landing Gear Emergency Control
9. Clock
10. Airspeed Indicator
11. Attitude Gyro Indicator
12. Panel Lights
13. Compass Indicator
14. Manifold Pressure Gage
15. Landing Gear Position Indicator

Figure 33—Cockpit—L. H. Side, Forward and R. H. Side—F8F-1 and -1B



FORWARD VIEW



RIGHT HAND VIEW

witches

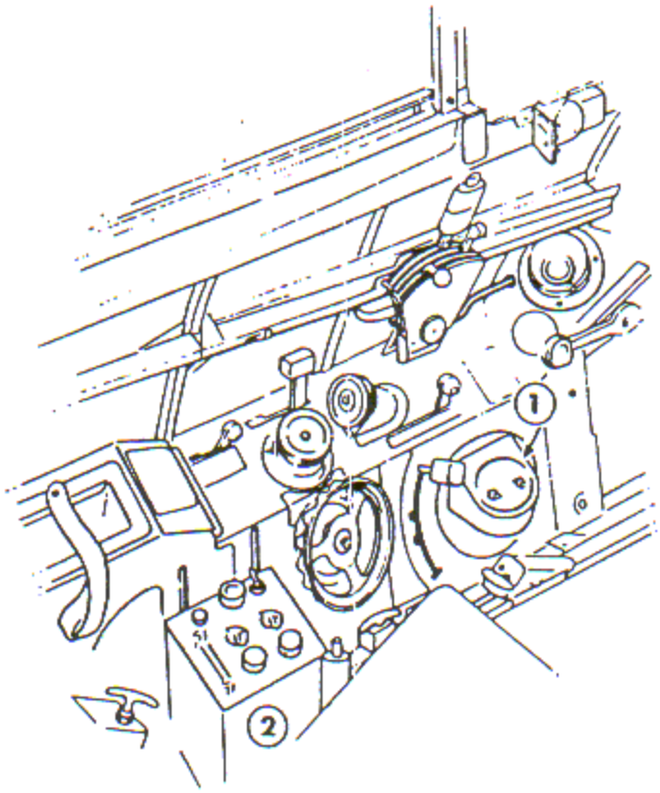
tcnes

ntrol

ator

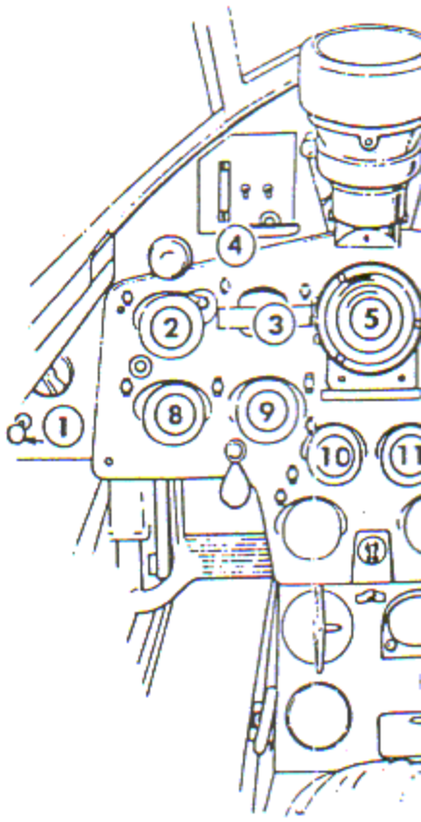
16. Altimeter
17. Directional Gyro Indicator
18. Turn and Bank Indicator
19. Tachometer
20. Gun Charging Controls
21. Engine Gage Unit
22. Cowl Flaps Switch
23. Cylinder Head Temperature Gage
24. Fuel Tank Selector Valve
25. Accelerometer
26. Rocket Selector Switch
27. Auxiliary Fuel Pump Switch
28. Fuel Reserve Warning Light
29. Fuel Quantity Gage
30. Fuselage Manual Tank Release Control

1. Cockpit Canopy Control
2. Hand Microphone
3. Oxygen Gage
4. Oxygen Regulator
5. Voltmeter
6. Electrical Distribution Panel
7. Fresh Air Control
8. Electrical Distribution Panel
9. Radio Control Panel
10. IFF Destructor Switch
11. Microphone Jack
12. Circuit Breaker Panel
13. Hydraulic Hand Pump
14. Hand Pump Selector Valve
15. Oxygen Tank Valve Control
16. Manual Bomb Release Control
17. Oxygen Flow Indicator
18. Chartboard Rail



LEFT HAND VIEW

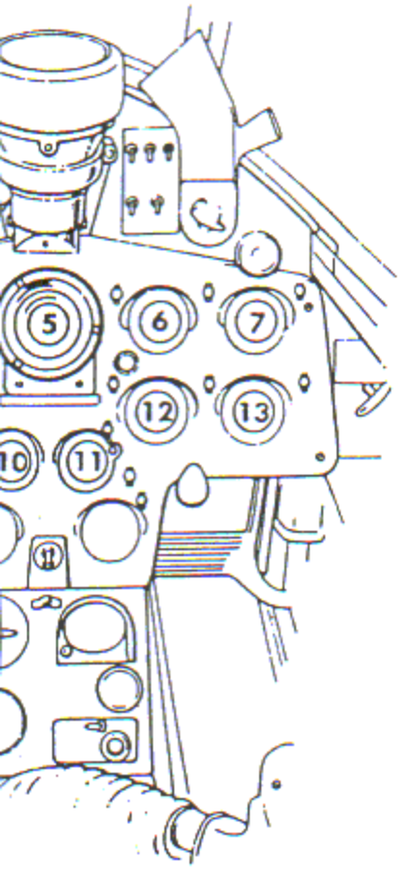
1. Landing Gear Indicator
2. Radar Control Box



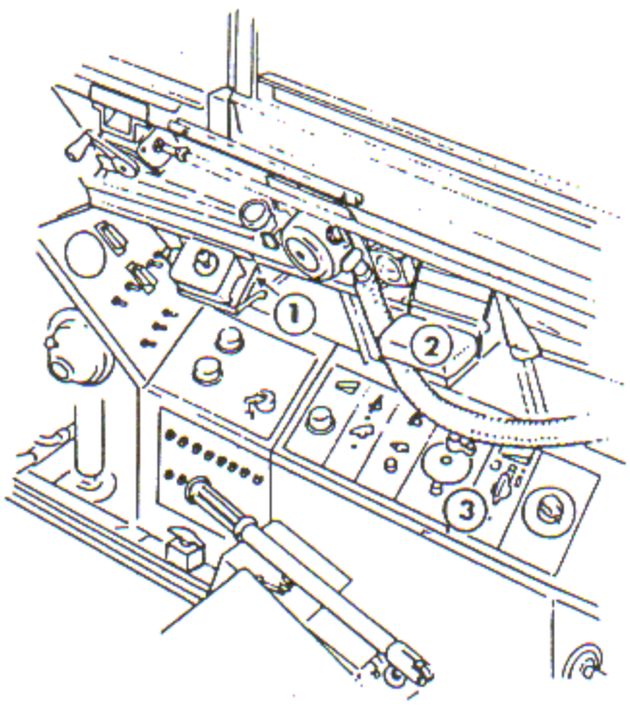
FORWARD

The F8F-1N (Night Fighter) diff
(Day Fighter) in the following resp

1. Windshield Degreasing Control
2. Radio Altimeter Indicator
3. Directional Control Unit
4. Automatic Pilot On-Off Control
5. Radar Indicator
6. Bank and Climb Control Unit
7. Manifold Pressure Gage
8.
9.
10.
11.
12.
13.



WARD VIEW



RIGHT HAND VIEW

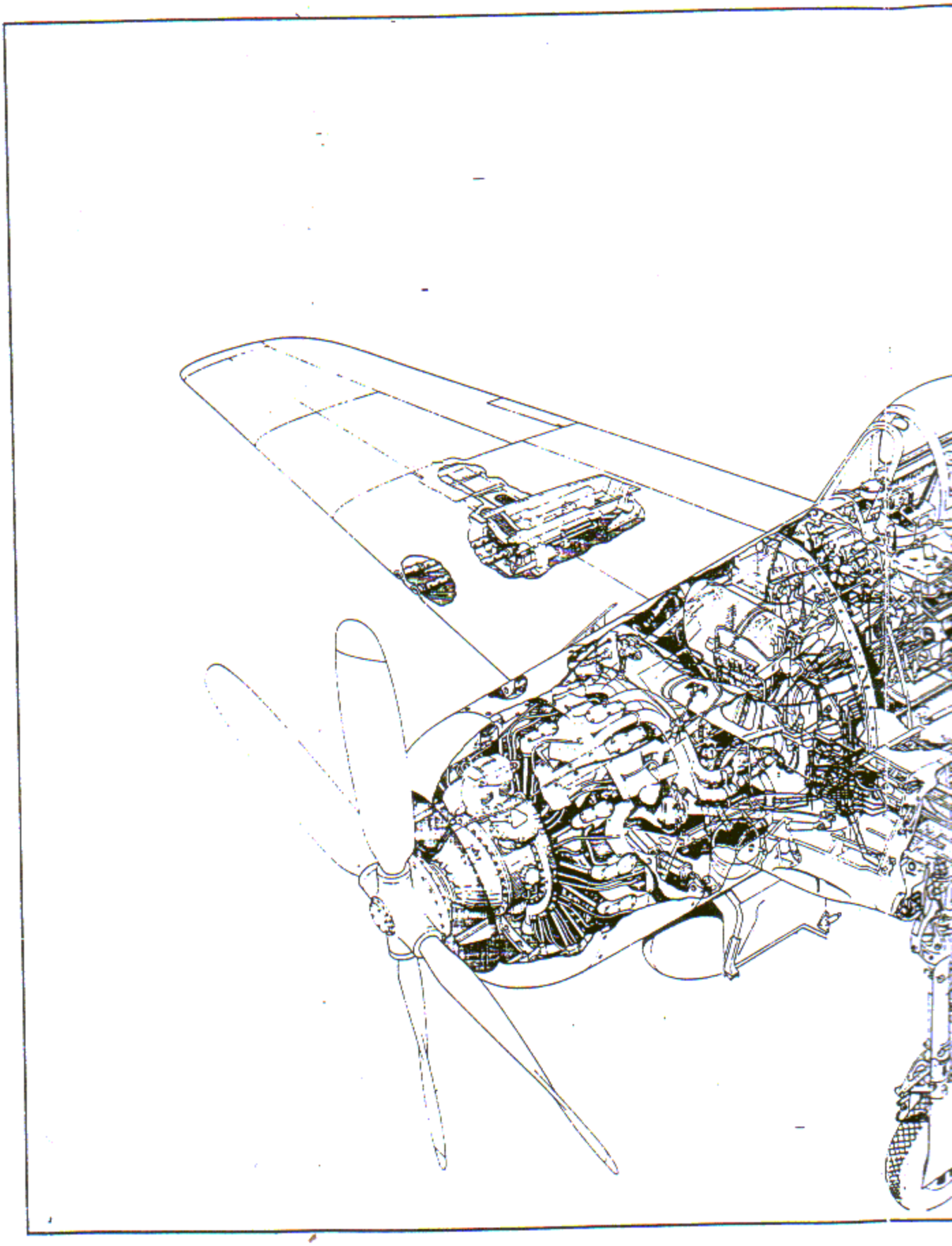
ter) differs from the F8F-1
ing respects:

rol
trol
t

8. Altimeter
9. Airspeed Indicator
10. Compass Indicator
11. Clock
12. Turn and Bank Indicator
13. Tachometer

1. Automatic Pilot Controller
2. Arm Rest
3. Radio Controls

Figure 34—Cockpit—L. H. Side, Forward and R. H. Side—F8F-1N



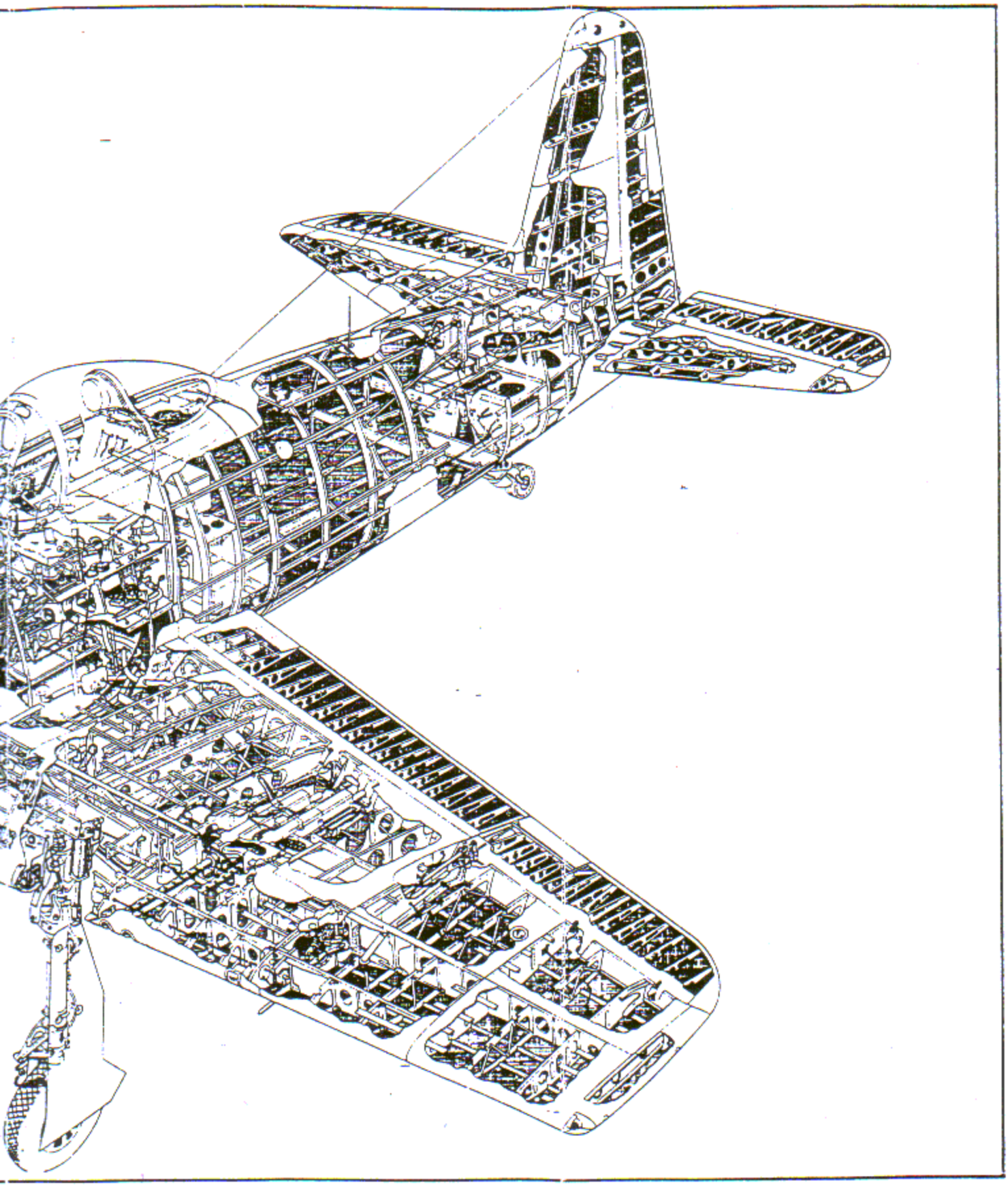
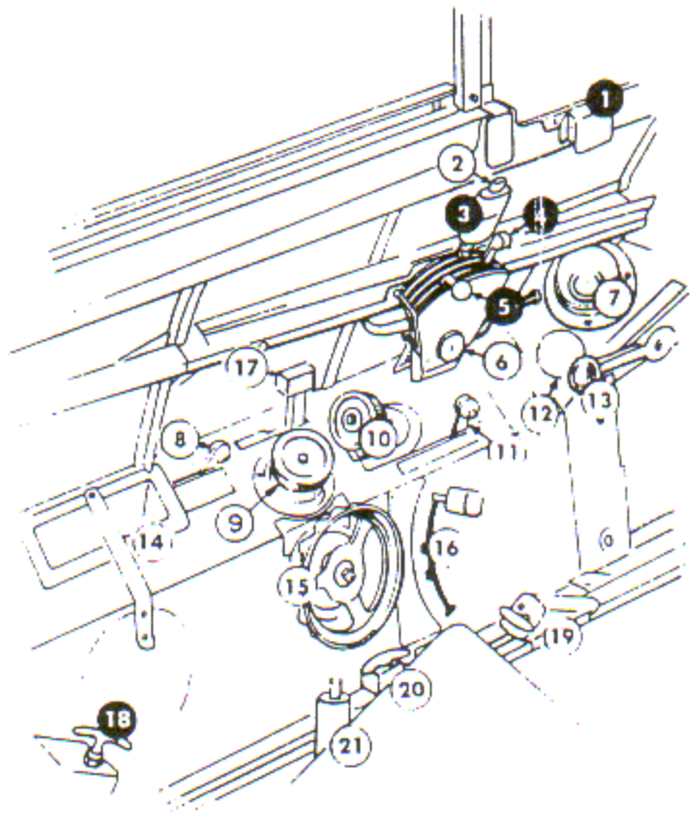
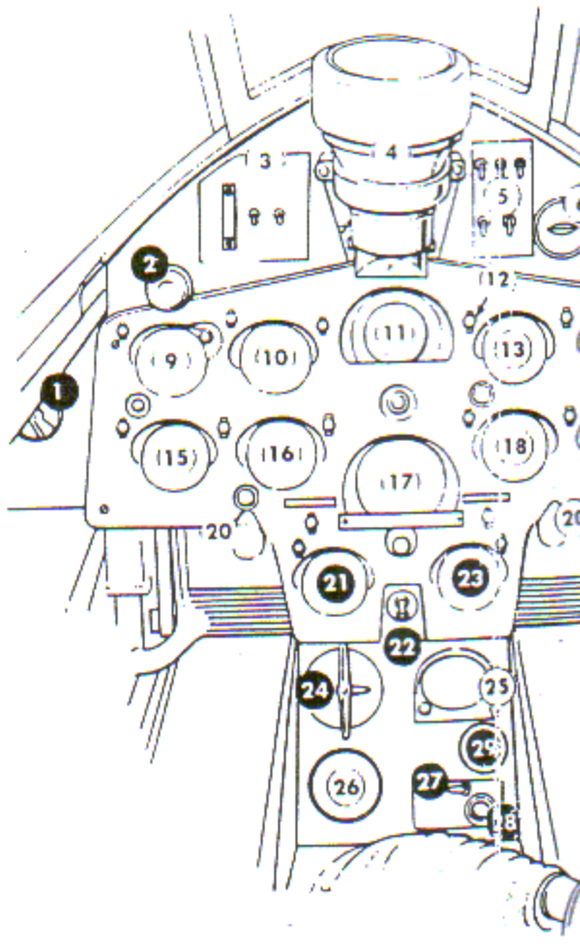


Figure 29—Interior Arrangement Diagram



LEFT HAND VIEW

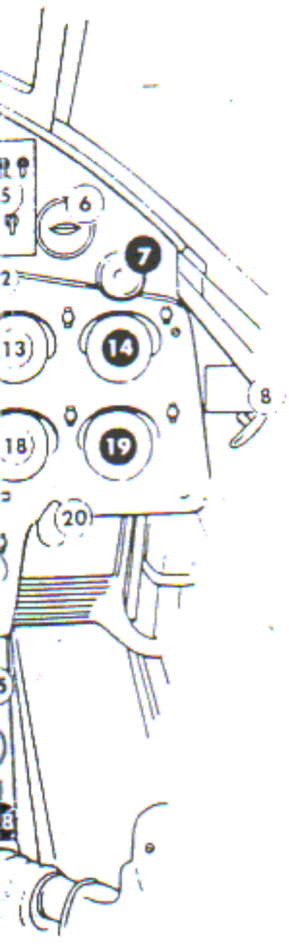


FORWARD VIEW

1. W.E.P. Switch
2. Microphone Switch
3. Throttle Control
4. Propeller Pitch Control
5. Mixture Control
6. Control Quadrant Friction Knob
7. Fresh Air Control
8. Oil Cooler Shutter Control
9. Rudder Trim Tab Control
10. Aileron Tab Control
11. Tail Wheel Lock Control
12. Hydraulic Pressure Gage
13. Landing Gear Control
14. Map Case
15. Elevator Trim Tab Control
16. Wing Flaps Control
17. Dive Recovery Flap Control
18. Fuel Pressurizing Control
19. Arresting Hook Control
20. Manual Bomb Release Control
21. Anti-Blackout Connection Fitting

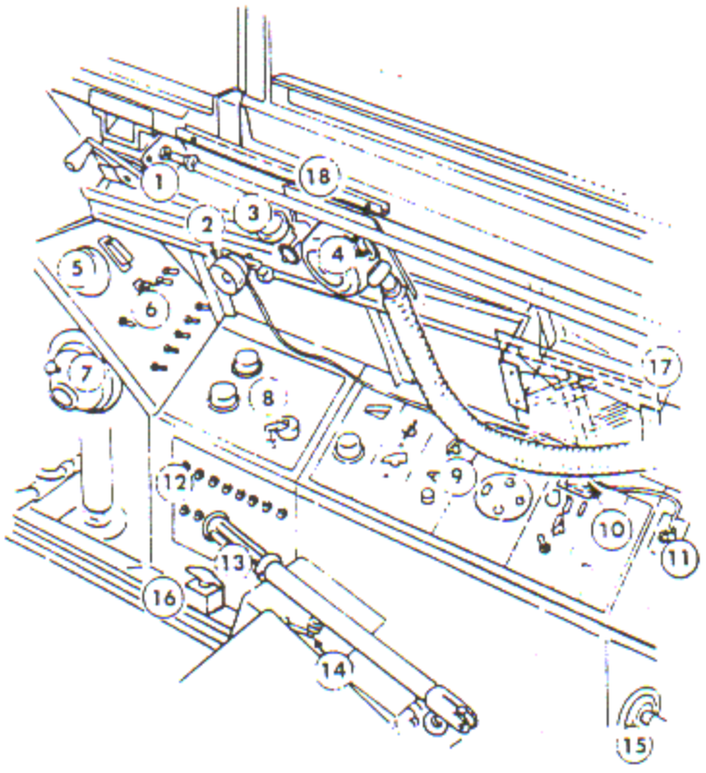
1. Ignition Switch
2. Supercharger Control
3. Armament Master and Gun Switches
4. Gun Sight
5. Bomb, Tank and R. P. Switches
6. Oxygen Flow Indicator
7. Carburetor Air Control
8. Landing Gear Emergency Control
9. Clock
10. Airspeed Indicator
11. Attitude Gyro Indicator
12. Panel Lights
13. Compass Indicator
14. Manifold Pressure Gage
15. Landi
16. Altim
17. Direct
18. Turn
19. Tacho
21. Engin
22. Cowl
23. Cylin
24. Fuel
25. Accel
26. Rocke
27. Auxil
28. Fuel
29. Fuel

Figure 28—Cockpit—R. H. Side, Forward and L. H. Side



IEW

Landing Gear Position Indicator
Altimeter
Directional Gyro
Turn and Bank Indicator
Tachometer
Engine Gage Unit
Cowl Flaps Switch
Cylinder Head Temperature Gage
Fuel Tank Selector Valve
Accelerometer
Rocket Selector Switch
Auxiliary Fuel Pump Switch
Fuel Reserve Warning Light
Fuel Quantity Gage



RIGHT HAND VIEW

1. Cockpit Canopy Control
2. Hand Microphone
3. Oxygen Gage
4. Oxygen Regulator
5. Voltmeter
6. Electrical Distribution Panel
7. Fresh Air Control
8. Electrical Distribution Panel
9. Radio Control Panel
10. Destructor Switch
11. Microphone Jack
12. Circuit Breaker Pane
13. Hydraulic Hand Pump
14. Hand Pump Selector Valve
15. Oxygen Tank Valve Control
16. Manual Bomb Release Control
17. Chartboard
18. Chartboard Rail

SECTION II
NORMAL OPERATING INSTRUCTIONS

1. BEFORE ENTERING THE COCKPIT.

a. RESTRICTIONS.

(1) The following flight maneuvers are prohibited:

Prolonged spin Inverted spin

The following maneuvers are prohibited when carrying external stores:

Any spin	Snap roll	Immelman turn
Loop	Chandelle	Inverted flight (except when entering dives)

(2) The maximum permissible combinations of speed and acceleration at various altitudes are shown in figure 69 for a gross weight of 10200 pounds. At other weights the permissible accelerations are such as to maintain a constant product of gross weight and acceleration except that 7.5g positive and 3.7g negative shall not be exceeded even at very low gross weights.

(3) The various combinations of speed and acceleration shown in figure 69 represent the aerodynamic and structural limits of the airplane. Although the airplane has sufficient strength for high "g" stalls up to 6.0g, high "g" stalls above 4.0g should be avoided because of the severe vibrations which follow the stall. The maximum attainable accelerations are limited by compressibility effects which first appear just below the limits given for each altitude in the form of buffeting. The strength of the airplane is sufficient to withstand considerable buffet vibration, but if the buffet boundaries are exceeded, various aerodynamic phenomena will be encountered including changes in the control and stability characteristics; the severity of these phenomena increases rapidly as the boundaries are exceeded. It is therefore important that pilots avoid exceeding these limits.

(4) At and above the maximum speed limitations shown in figure 69 for the various altitude levels the airplane exhibits a tendency to oscillate longitudinally and to "tuck under". These first manifestations are not dangerous but are a warning of impending full loss of longitudinal control with further increase in speed which will necessitate the use of the dive recovery flaps for recovery. These flaps should be used immediately upon noting any tendency of the airplane to oscillate longitudinally, i.e., nosing up and down. When the dive recovery flaps are lowered prior to entering the compressibility range, the pilot does not need to use the stick for recovery. However, when the compressibility range has been entered, lowering of the dive recovery flaps will only neutralize most of the compressibility effects and the pilot must use the stick for recovery as in a normal pull-out.

(5) The wings of these airplanes were initially provided with a novel design feature, referred to as "safety tips", designed to fall when the wings were inadvertently overloaded in flight, and thereby result in an airplane with reduced span and greater ability to withstand flight loads. Because of fatal accidents resulting from violent uncontrolled motions after loss of only one of the wing tips, a wing tip jettisoning device was developed for service installation which was intended to insure that when one wing tip failed due to inadvertent overloading the other wing tip would be shed explosively immediately after the first wing tip failed. However, it has not been possible to make and maintain a continuously reliable installation of the explosive wing-tip-shedding device in service airplanes. Therefore instructions, have been issued, providing for elimination of the safety wing tip feature and restoration of the full strength of the wing tip connection.

(6) Restrictions on the operation of the landing gear, landing flaps, ailerons, and rudder are given below. All speeds are indicated airspeeds.

(a) Landing gear—The maximum permissible speeds are:

For extending or retracting landing gear 140 knots
For flying with landing gear fully extended 160 knots

(b) Landing Flaps—The maximum permissible speed for flight with the landing flaps extended is 220 knots (landing flaps are protected by a blow-up mechanism up to this speed regardless of control setting).

(c) Ailerons—The maximum permissible speeds and accelerations for unrestricted use of ailerons for each altitude are indicated by dotted lines on figure 69. The maximum acceleration of 4.5g shown on the figure applies to aileron operation when flying without external stores or when carrying any of the stores listed in paragraph 11 except droppable fuel tanks and/or 1000-lb bombs, in which case the maximum permissible acceleration for unrestricted use of ailerons is 4.0g.

(d) Rudder—The maximum permissible speed for full rudder deflection is 240 knots.

(7) The maximum recommended gross weights for various operations are as follows:

Take-off, rough runways	12500 lb
Take-off, smooth paved runways	13100 lb
Catapulting	13100 lb
Landing, rough runways	12100 lb
Landing, smooth paved runways	13100 lb
Arrested Landing	10300 lb

Note: Approximate weights, including full ammunition (no rockets), 185 gallons of fuel, water, oil, and pilot are listed below for information:

F8F-1	9850 lb
F8F-2	10350 lb

(8) Flight tests with the Mark 5 (150-gallon) external auxiliary tank installed on the fuselage have indicated that buffeting due to this installation may be expected at speeds in excess of 350 knots IAS at 10000 feet and below, and at lower speeds at altitudes in excess of 10000 feet (reduce speed 30 knots for each 5000-foot increase above 10000 feet). Flight test with the Mark 12 (150-gallon) external auxiliary tank have indicated that acceleration and speed restrictions are those of the clean airplane at appropriate gross weights.

(9) It is recommended that in dives with external stores, recovery from the dive or release of the stores be executed at the first indication of buffeting and prior to its build-up to objectionable or destructive intensity.

(10) With the Mark 5 tank installation on the fuselage of the airplane, caution is recommended in certain maneuvers because of the following characteristics:

(a) Right rudder effectiveness in take-off and wave-off is marginal.

(b) Directional stability is reduced so that adverse yaw in entering and stopping turns may be expected.

(c) Low directional stability may cause the tank installation and the vertical tail to be overloaded if appreciable sideslip or skid is allowed to develop at high speeds.

Since Mark 5 and Mark 12 tanks are similar in shape the above recommendation applies also to the latter tanks.

(11) With the following commonly used external stores, additional restrictions and specific instructions for operations are indicated below.

Item	Maximum permissible positive acceleration	Permissible Operations Catapulting	Arrested Landings
	Fuselage Installation		
One MK 5 external auxiliary tank (150-gallon)	6.0g	Yes	No (1)
One MK 12 external auxiliary tank (150-gallon)	—(2)	Yes	No (1)
One MK 4 external auxiliary tank (100-gallon) alternate	—(2)	Yes	No (1)
One ASO No. C4A-1 trimetrogon camera capsule (F8F-2P)	—(2)	Yes	Yes
	Wing Installation		
Two MK 4 external auxiliary tanks (100-gallon)	5.0g	Yes	No (1)
Two 1000-lb bombs	5.0g	Yes	No
Two 500-lb bombs	—(2)	Yes	Yes
One or two 250-lb bombs	—(2)	Yes	Yes
Up to 4 HVAR	6.0g	Yes	No
Up to 4 AR	—(2)	Yes	No

(1) Arrested landings are permissible only when tanks are empty.

(2) Acceleration limitations are those for the airplane at appropriate gross weights and altitudes.

Combination of the above loads, within airplane gross weight limitations, does not require additional or more severe restrictions for either flight or ground operation. An unbalanced load of 250 pounds must never be exceeded at low speeds when carrying external stores on the wings, because of marginal to unsatisfactory control characteristics under such conditions. With a greater unbalance, as from dropping only one wing bomb, the minimum recommended speeds are as follows:

500 pounds unbalance—250 knots IAS; 1000 pounds unbalance—300 knots IAS.

Although the airplane is equipped to carry Tiny Tims (11.75 in. AR) on the centerline and on the wings, operations with these items shall not be conducted until authorized by the Bureau of Aeronautics, since the blast effect on the airplane from firing these rockets has not been determined. Instantaneous salvo firing of AR and HVAR is prohibited.

(12) In the interests of minimizing the severity of carrier landings from the stand-point of developing vertical impact loads upon the airplane structure, it is recommended that high cut height in combination with low airspeed at the time of cut be avoided. This should be done to as great an extent as is practicable and consistent with the other factors which go toward determining the manner in which aircraft should be landed aboard with a maximum of safety and efficiency of operation. The following conditions are recommended:

The height above the deck at the time of cut should be between 15 and 25 feet, and the calibrated airspeed at the time of cut should not be less than 75 knots at 8400 pounds or 80 knots at 9350 pounds. (These values of airspeed are approximately 3 to 5 knots above the power-off stalling speed.)

(13) If and when a maximum allowable airspeed indicator is installed in accordance with a service change yet to be issued, the instrument should be preset to indicate a maximum permissible airspeed of 425 knots and a maximum permissible Mach number of 0.75.

(14) ENGINE SPEEDS.—Maximum diving rpm—3100 for 30 seconds.

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

b. TAKE-OFF GROSS WEIGHT AND BALANCE.

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

c. EXTERIOR CHECK.

(1) Make sure the airplane has been serviced with the proper quantities of fuel, oil, water injection fluid, hydraulic fluid and oxygen.

(2) Make the standard exterior check of the airplane.

d. ENTRANCE TO AIRPLANE. — The cockpit is accessible from either side of the airplane. A step is located on the fuselage aft of the wing trailing edge and a hand grip is located above and aft of the wing. To open the cockpit, push and hold in the release button on the right hand side of the fuselage below the windshield, then push the canopy aft. Later models have a door adjacent to the handcrank.

2. ON ENTERING PILOT'S COCKPIT.

a. STANDARD CHECK FOR ALL FLIGHTS.

(1) Landing gear control — "DOWN" and LOCKED.

(2) Surface controls locking device—OFF.

(3) Ignition switch—"OFF".

(4) Wheels chocked.

(5) Adjust shoulder harness and rear view mirror.

(6) Automatic pilot control (F8F-1N and -2N) —"OFF". Adjust rudder pedals. Check stick and pedals for freedom and full throw; watch control surfaces.

(7) Mixture control—"IDLE CUT-OFF".

(8) Battery switch—"ON".

(9) Generator switch—"ON".

(10) Check fuel supply.

(11) Check the following (refer to Section V:)

(a) Communicating equipment.

(b) Gun sight and ammunition.

(c) Oxygen supply and system.

(d) Camera operation—F8F-2P only.

(12) All armament switches—"OFF".

(13) Set sensitive altimeter.

(14) Uncage directional gyro.

(15) Check landing gear position indicator, with battery switch "ON". Red and white diagonals should disappear, and black and white wheels should appear.

(16) Arresting hook stowed—green light OFF.

(17) Wings spread and locked. Warning signals flush with wing skin.

(18) Fuel pressurizing handle—"PRESSURE".

(19) WEP switch—"OFF".
(20) Tail wheel control—"UNLOCKED".
(21) Wing flaps—"UP".
(22) Oil dilution switch—"OFF".

b. SPECIAL CHECK FOR NIGHT FLIGHTS.

(1) Battery switch—"ON".
(2) Generator switch—"ON".
(3) Instrument and cockpit lights—turn "ON" and adjust to best light.
(4) Test operation of the following switches and lights:
(a) Exterior.
(b) Formation and section.
(c) Running.

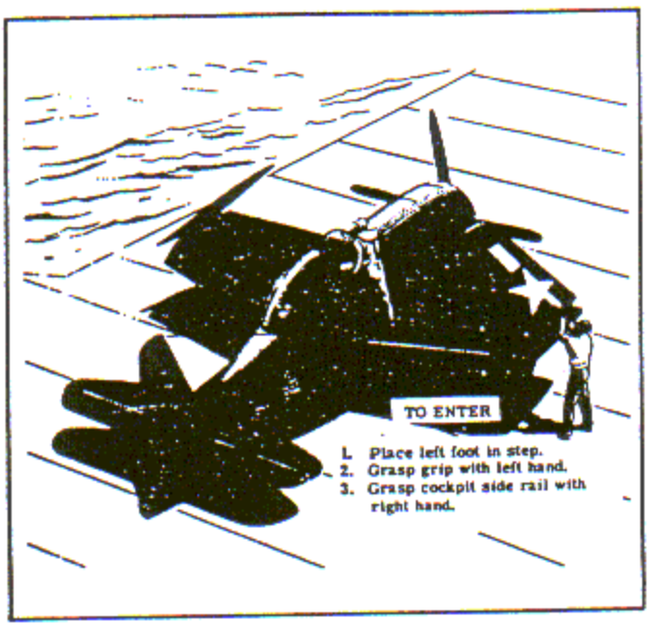


Figure 37—Entrance to Airplane

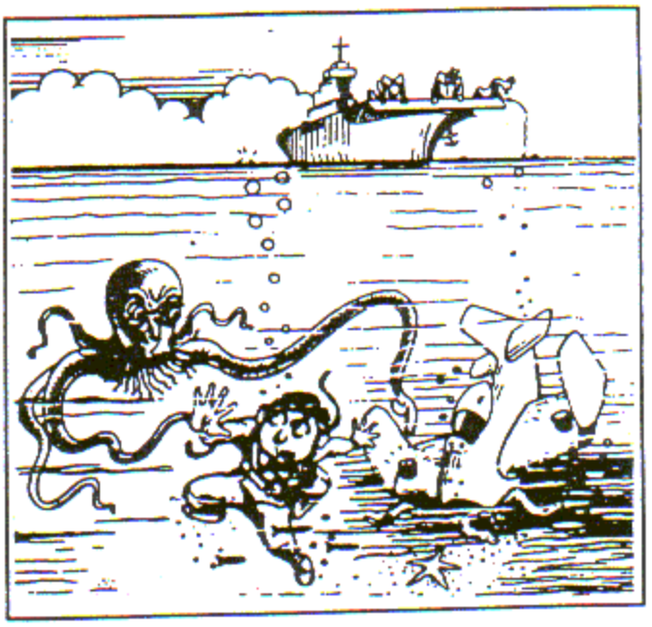


Figure 38—Lock Wings

(d) Formation.

(e) Tail—later models.

(f) Section.

(5) Lower arresting hook to test approach light. Ground crew must stow hook.

3. FUEL AND OIL SYSTEM MANAGEMENT.

a. OPERATION OF FUEL SYSTEM. — The fuel system is managed primarily with the fuel tank selector and auxiliary fuel pump switch.

(1) After warm-up, take-off, and a minimum altitude of 3000 feet has been reached, rotate tank selector to wing droppable (right or left) keeping the fuselage droppable for last.

(2) If fuel pressure drop is indicated on the engine gage unit (fuel pressure dial) it will be accompanied by a drop in engine performance. More than likely the tank being used is empty or nearly so, providing the remainder of the system is functioning normally. Select another tank immediately and turn "ON" the auxiliary fuel pump. Keep this pump "ON" until fuel pressure becomes steady.

(3) The carburetor bleed-back (vapor vent) line returns (approx) one gallon per hour to the main tank. Also, when the fuel transfer system is in operation, fuel at the rate of (approx) 30 gallons per hour is fed to this tank until it is nearly full.

WARNING

If the auxiliary fuel pump should fail during fuel transfer operations, the transfer line to the main tank will be a source of air leakage into the main fuel line. This leakage will result in breaking the suction from the drop tank and air locking the carburetor and fuel system. This may result in an engine sputter or complete cut either of which is followed by fluctuating fuel pressure. Tests have shown that approx 90 seconds may be required after a cut to recover normal engine operation without the auxiliary fuel pump.

(4) In case of a failure of the type noted in the above warning, use the following procedure:

(a) Turn auxiliary fuel pump switch "OFF" immediately.

(b) Switch selector valve to "MAIN" tank.

(c) To obtain a "RESTART" if the engine has cut out:

1. PLACE the mixture in "IDLE CUT-OFF". This will clear the engine and insure that the entrapped air is expelled thru vapor vents rather than thru the fuel passages of the carburetor.

2. RETARD the throttle to ONE THIRD OPEN.

3. ADVANCE mixture control to "RICH" when rapid fluctuations of fuel pressure have subsided. When smooth engine operation has been regained the selector valve may be returned to "DROP TANK" until its fuel is exhausted. It is essential that the auxiliary pump switch be kept in the "OFF" position throughout the remainder of the flight to avoid air leakage through the fuel transfer line.

WARNING

Wing tanks should not be jettisoned at a speed greater than 170 knots. Fuselage tanks may be jettisoned at high speeds in level flight. It is advantageous to apply a small positive g before jettisoning any droppable tank.

b. OPERATION OF OIL SYSTEM.— The operation of the oil system is automatic except for the setting of the oil cooler shutters. These shutters are controlled by a hydraulic lever on the left hand shelf. During flight, oil temperature can be reduced more rapidly by reducing rpm than by throttling only.

(1) F8F-1 OIL TEMPERATURE AND PRESSURE LIMITS.

Scramble take-off	40°C.
Ground Test	40°C min.
Desired	60-85°C, 75 to 95 psi.
Maximum	95°C, 100 psi.

(2) F8F-2 OIL TEMPERATURE AND PRESSURE LIMITS.

Scramble take-off	40°C.
Ground Test	40°C min.
Desired	85°C, 90 to 100 psi.
Maximum	100°C, 120±5 psi.

(3) During cold weather operation, hard starting of the engine is minimized by using gasoline to thin the oil during the previous stopping of the engine. This is accomplished by operating the oil dilution system, consisting mainly of an electrically operated solenoid valve located in the engine accessory compartment. The gasoline for oil dilution is taken from the upper portion of the fuel strainer unit. A manual shut-off valve, located just outboard of the fuel transfer solenoid valve, provides protection against the possibility of inadvertant operation of the oil dilution system. This valve is safety-wired in the closed position whenever weather conditions do not require oil dilution. The oil dilution solenoid valve control switch is located on the electrical switch panel.

4. STARTING ENGINE.

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

b. Mixture—"IDLE CUT-OFF".

c. Fuel tank selector—"MAIN".

d. Propeller control—FULL "INCREASE RPM".

e. Throttle — Sufficient opening to give approximately 1000 rpm. (One inch open approx.)

f. Supercharger—"LOW" (F8F-1) and F8F-2 with manual supercharger control.

g. Carburetor air—"DIRECT".

h. Cowl flaps—"AUTO" (F8F-1).
Cowl flaps—"OPEN" (F8F-2).

i. Oil cooler shutters—Position dependent on temperature.

j. Battery switch—"ON".

k. Generator switch—"ON" (leave "ON" at all times except emergency).

l. Auxiliary fuel pump switch—"ON".

Note

Check that fuel pressure gage indicates 22±1 psi (F8F-1) and 25±1 psi (F8F-2) when auxiliary fuel pump is operating alone.

m. Ignition switch—"BOTH".

n. Starter switch—"ON".

o. Primer switch—"ON" as necessary.

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

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

CAUTION

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

Note

1.

Engage starter.

2.

Prime as engine is being cranked until engine commences to fire. Priming time will vary from two to ten seconds depending on conditions. Very cold engines may require as much as fifteen seconds priming.

3.

DO NOT use mixture control to prime.

4.

When engine begins to fire regularly on prime, move mixture control to "RICH". Do not pump throttle.

5.

There will be a lapse of time after moving the mixture control into the "RICH" position until fuel feeds from the discharge nozzle. Therefore, it is IMPORTANT to keep the engine firing regularly (at least 350-400 rpm) by continuing to use the priming switch until normal carburetion is established. If, for any reason, the engine stops firing, move the mixture control to "IDLE CUT-OFF" immediately and continue cranking until engine starts. Do not exceed the time limit for the continuous use of the starter.

6.

During cold starts with cold stiff oil, particular care should be exercised that the boost control is not advanced beyond about 1/3 of the control travel at any time during cranking. Cold stiff oil may enter the AEC and cause the carburetor throttle to open wide; and when a start is accomplished a large amount of uncontrollable power will result, possibly enough to nose an airplane over. The stiff oil will be slow in draining, even though the boost control is quickly returned to the closed position. This condition will not occur during starting unless the boost control is advanced beyond the 1/3 open position, and it will not occur at any time on the ground or in flight with warm oil.

5. WARM-UP AND GROUND TEST.

CAUTION

Do not exceed 38 in. Hg during ground run-up or airplane will not be able to be held by the brakes. Recommend using wheel chocks and tie-downs during all ground operations.

a. Open throttle to 1200 rpm until oil-in temperature reaches 40°C range. A sharp increase in oil pressure, when the throttle is opened, indicates that further warm-up is required.

b. CHECK MAGNETOS.—With engine running at 2000 rpm, or 30 in. Hg and "RICH" mixture, operate on each magneto for shortest possible time. If rpm drop exceeds 50-100, stop engine and investigate.

CAUTION

Return switch to "BOTH" between checks to clear engine.

c. CHECK IDLE MIXTURE SETTING.—Upon completion of the magneto check, use the following procedure to see if the engine has a correct idle mixture setting:

(1) Close throttle slowly to "IDLE" position and allow the cockpit gages to stabilize.

(2) Move the mixture control lever gradually toward "IDLE CUT-OFF" while observing the manifold pressure gage for a dip in manifold pressure as an indication of a momentary rise in rpm during the leaning process. As soon as the manifold pressure has increased one inch or reaches an unstable condition indicative of a too-lean mixture, move the mixture control forward to prevent "cutting" of the engine. Experience will show that the mixture control movement can be kept to a minimum and that is is usually not necessary to move the control into full "IDLE CUT-OFF", i.e., back-and-forth movement of the control can be confined to a region between "NORMAL" and "IDLE CUT-OFF".

(3) If the manifold pressure dips before it rises, the idle mixture is richer than "BEST POWER". If it dips more than 0.1 in. Hg, it is too rich. If the manifold pressure fluctuates while waiting for conditions to stabilize and rises immediately upon leaning the mixture, the idle setting is too lean.

CAUTION

The auxiliary fuel pump should be "ON" and the idle check should be run at least twice. Whereas air consumption of the engine varies with cylinder head temperature, idle fuel flow is a function of throttle position only. The idle mixture will become richer as the cylinder heads cool (air consumption decreases as valve over lap increases), therefore, to avoid "loading" the engine during let-downs and landings, idle mixtures found to be appreciably richer than "BEST POWER" (when checked on the line) should not be allowed to remain so. Idle adjustments with a thoroughly warmed engine should favor the lean side of "BEST POWER".

d. SUPERCHARGER CHECK AND DESLUDGING PROCEDURE—F8F-1.—The supercharger check should never be made nor the clutches desludged until the oil temperature has reached 40°C, and it is preferable to wait until the oil temperature has reached 60°C. If there is not enough time to complete a regular supercharger check, desludge the clutches twice as directed in paragraph (4) below.

(1) Adjust the throttle to obtain 1400 rpm, then move the supercharger control rapidly into the "HIGH" position. Never stop movement of the control between the "LOW" and "HIGH" positions.

(2) Advance the throttle to obtain 22 in. Hg and note the tachometer reading as soon as the manifold pressure has stabilized. Remain in high blower for a minimum of 30 seconds.

(3) Move the supercharger control from "HIGH" to "LOW", and readjust the throttle to obtain 22 in. Hg. Note the tachometer reading as soon as the manifold pressure has stabilized. If the supercharger is operating properly, the rpm in low blower will be higher than the rpm in high blower for the same manifold pressure.

(4) To complete the desludging of the clutches, readjust the throttle to obtain 1400 rpm, and move the supercharger control into the "HIGH" position. After 30 seconds in "HIGH", return the supercharger control to "LOW".

e. CHECK PROPELLER CONTROL. — With engine at 1800 rpm move propeller control toward "DECREASE RPM" until a 300 rpm drop is indicated; then return control to full "INCREASE RPM". When returned to "INCREASE" position, rpm should be steady and free from surging. The constant speed range of the propeller governor is between 1200 and 2800 rpm.

f. CHECK INSTRUMENTS, OPERATING AT 1800 RPM.

(1) Oil:

(a) F8F-1—60°-85°C and 75- 95 psi.

(b) F8F-2—60°-85°C and 100-110 psi.

(2) Fuel pressure — 21-23 psi (F8F-1) — 25±1 (F8F-2). Switch "OFF" auxiliary fuel pump during this check.

(3) Cylinder head temperature 130°C (desired minimum). Note manifold pressure as reference for future checks.

g. GENERATOR SYSTEM CHECK.

(1) Have the ground crew disconnect the external power source.

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

(3) Check the closing of the reverse current cutout by slowly increasing the engine rpm. The volt-

meter reading should increase to the value at which the reverse current relay cut-out closes, which will be indicated by a dip in voltage. This will occur at approximately 26.5 volts.

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

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

h. WING FLAPS.—Operate wing flaps control and make a visual check to see that the flaps are operating properly. Also as no flow equalizer is installed in the flap line it is possible by rapid selection of the various flap positions to get them out of synchronization while on the ground. Always use either the full "UP" or "DOWN" setting for take-off—any desired setting can be used in the air.

CAUTION

If there are no airloads on the flaps their travel may not be equal as the follow-up system is on the left flap only.

i. PITOT TUBE HEAT. — Switch "ON" if icing conditions prevail.

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

k. AUTOMATIC PILOT CHECK.—In order to insure that the automatic pilot is functioning properly, check its operation in the following manner:

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

(2) Bank and climb gyro—"UNCAGED"

(3) Directional gyro—"UNCAGED"

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

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

CAUTION

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

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

(7) Centralized Position Check (Electrical System Check).—Move the control stick to a position other than neutral then pull the ON-OFF control "T" handle to "CENTRALIZED". The electrical system should return the control stick to a neutral position.

Note

In the F8F-2N (GR-2 installation) a red warning light illuminates (on the instrument panel) whenever this handle reaches the "CENTRALIZED" position.

(8) Overpower Check.—Check to be sure that the automatic pilot can be over-powered with the ON-OFF control handle in the "ON" position. After this check, disengage the automatic pilot by pushing ON-OFF control handle to "OFF".

6. SCRAMBLE TAKE-OFF.

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

(1) Oil pressure is steady.

(2) Oil temperature—at least 40°C.

(3) Throttle may be advanced without causing engine to cough or cut out.

7. TAXIING INSTRUCTIONS.

a. Taxi with the tail wheel unlocked except in strong cross winds. A steady run of the engine is preferable to repeated short bursts of power.

b. Use brakes for adequate directional control though rudder will be found to be moderately effective. Do not build up too much speed while taxiing in order to maintain proper braking action.

8. TAKE-OFF.

CAUTION

With external load items mounted on the wings, an unbalanced load condition of 250 pounds must never be exceeded on account of marginal to unsatisfactory control characteristics at low speeds with a greater amount of unbalance.

a. CLEAR ENGINE.—It is necessary to clear the engine at high power immediately before take-off. Chock wheels and open throttle to 32 in. Hg or more.

b. CHECK-OFF LIST.

(1) Wings—SPREAD and LOCKED.

(2) Canopy—OPEN (close before reaching 175 knots IAS).

(3) Shoulder harness—TIGHT.

(4) Obtain traffic clearance.

(5) Cowl flaps—as required.

(6) Carburetor air—"DIRECT". If icing conditions exist, use "PROTECTED AIR" to clear engine, then switch to "DIRECT" for take-off.

(7) Oil cooler shutters—as required.

(8) Propeller "FULL INCREASE" (2800 rpm).

(9) Mixture—"RICH".

(10) WEP switch—"OFF".

(11) Supercharger—"LOW" (F8F-1) and also F8F-2 with manual control.

(12) Fuel tank selector—"MAIN".

(13) Auxiliary fuel pump—"ON".

(14) Tabs control settings (approx).

(a) Aileron—0.

(b) Elevator—1 small mark "NOSE DOWN".

(c) Rudder—0.

(15) Wing flaps — "UP" or full "DOWN" only. (Full down for minimum run.)

(16) Tail wheel—"LOCKED" for land—"UNLOCKED" for carrier.

(17) Throttle—open smoothly to 58 in. Hg (F8F-1, see figure 41)—60 in. Hg (F8F-2, see figure 42) and 2800 rpm. Do not use less than 40 in. Hg.

(18) Raise landing gear immediately after becoming airborne.

CAUTION

Rudder is extremely effective on take-off run; therefore, exercise against over-controlling. Torque tendencies are not excessive.

(19) Raise flaps.

(20) Adjust power plant according to the Power Plant Charts, Section III.

c. CATAPULT CHECK-OFF LIST.

(1) Canopy—"OPEN".

(2) Shoulder harness—TIGHT.

(3) Place back and head firmly against seat and headrest.

(4) Place feet against rudder pedals with legs stiff.

(5) Brace right arm.

(6) Wing flaps—full "DOWN".

(7) Check tab control settings.

(8) Friction of throttle and propeller levers should be sufficient to prevent controls from moving if hand is removed.

(9) Use full take-off power—58 in. Hg (F8F-1, see figure 41)—60 in. Hg (F8F-2, see figure 42) and 2800 rpm.

9. ENGINE FAILURE DURING TAKE-OFF.

a. Nose down to maintain flying speed—110 knots minimum, flaps down—120 knots minimum, flaps up.

b. Shoulder harness—TIGHT.

c. Jettison external load items — Safe armament units before release. Rockets cannot be safetied before release.

d. Lower wing flaps partially, saving the full down position for the final approach, only after making certain that the selected field can be reached.

e. If time permits:

(1) Ignition switch—"OFF".

(2) Battery switch—"OFF".

(3) Mixture control—"IDLE CUT-OFF".

(4) Fuel selector valve—"OFF".

10. CLIMB.

a. Reduce manifold pressure to 41 in. Hg (F8F-1)—46 in. Hg (F8F-2) approx and rpm to 2600 as soon as practicable.

b. Check that cowl flaps control switch is in "AUTO" position for F8F-1 and as required for F8F-2.

c. Operate oil cooler shutters as necessary.

d. Maximum permissible cylinder head temperature is 260°C (one hour only—F8F-1)—(30 minutes—F8F-2).

e. Maximum permissible oil temperature 95°C. (F8F-1)—100°C (F8F-2).

f. Refer to Section III and Appendix I for flight operation instruction charts, ranges and recommended power settings.

11. ENGINE MALFUNCTIONING.

a. In the event engine malfunctioning is experienced, such as partial or complete cut-out, perform the following:

(1) SHIFT TO "RICH".—In cases where engine cutting-out is induced by oi experienced in "NORMAL", shifting toward "RICH" will eliminate or alleviate the difficulty.

(2) INCREASE MANIFOLD PRESSURE.—Carburetor compensation characteristics are such that leaner mixtures are obtained at low loads. Increasing manifold pressure slightly will assist in overcoming tendency to lean-out.

WARNING

Avoid prolonged operation below 25 in. Hg in "NORMAL" mixture. Operation below 25 in. Hg in "NORMAL" exceeding approximately two minutes may cause the engine to cut-out.

12. GENERAL FLYING CHARACTERISTICS.

a. CONTROL AND STABILITY.—Controllability is very good throughout the speed range in both the clean and landing conditions. The ailerons and elevator are especially sensitive at high speed; consequently, large control movements should be avoided except when necessary. The effectiveness of the elevator, rudder and the ailerons is slightly lower in the landing condition but is more than ample.

(1) The very fine balance between control forces over a wide range of speeds is one of the airplane's most outstanding characteristics. All control forces are relatively light; hence, it is physically possible for an average pilot to apply such forces to controls that would impose excessive loads on the airplane.

(2) Small directional changes in trim with speed and power are readily apparent.

(3) Longitudinal stability is positive over the center of gravity range. There is, however, a rapid deterioration of stick free longitudinal stability as the cg is moved aft of 26% MAC with the landing gear retracted. For safe operation with the cg at 28.5% MAC, only those pilots thoroughly familiar with effects of longitudinal instability should fly the airplane. Lateral stability during a carrier approach is not too strong, which necessitates more attention being given in flying the airplane. In the carrier approach response to the rudder varies considerably. If the right rudder is applied very slowly, the left wing will either rise sluggishly or remain level; whereas, sharp application of right rudder produces negative rolling movements, the left wing dropping as a result of lateral instability. Left rudder deflection produces proper responses. The airplane climbs and accelerates rapidly as the power is applied, and rudder control increases with speed.

b. CRUISING.—Refer to Section III and Appendix I for cruising speed, fuel consumption, range, etc. Cruising operations may be conducted at normal rated or any lower power. If minimum fuel consumption is important and it is tactically feasible, cruising operations should be conducted at or below conditions labeled as "MAXIMUM CRUISE" on the Power Plant Chart. The engine should be operated in "NORMAL" for cruising power operation as shown on the Power Plant Chart. If cylinder temperatures rise above the limit, the mixture should be enriched. Do not exceed the cruising MP-RPM relationship specified in the chart. Adjust the tab controls for best results.

WARNING

Avoid prolonged operation below 25 in. Hg in "NORMAL" mixture. Operation below 25 in. Hg in "NORMAL" exceeding approximately two minutes may cause the engine to cut out.

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

d. SUPERCHARGER OPERATION—F8F-1.—The R-2800-34W engine is equipped with a two-speed supercharger and should be operated in the blower ratios specified on the Power Plant Chart, Section III. High blower ratio should only be used as indicated at altitudes where power is not available in low blower, as fuel economy is inferior in high blower and there is a greater tendency for the engine to detonate.

(1) Do not shift the supercharger control more often than at five minute intervals while in flight, except in an emergency, to allow dissipation of heat from the blower clutches. The control must be either full in or full out position to prevent clutch slippage and to insure availability of rated power at all times. If practicable, at the end of the five hours operation in either blower ratio, shift to the other ratio for five minutes to eliminate sludge accumulation in the clutch.

(2) Although it is possible to make clutch shifts at Military and Combat power, it should not be done except in an emergency; and, in general, clutch shifting should be confined to engine speeds between

1200 rpm and 2400 rpm. If "NORMAL" mixture is being used before shifting from "LOW" to "HIGH", it is not necessary to move the mixture control to "RICH" before making the shift. However, if the engine tends to cut-out during a shift while operating in "NORMAL", this tendency will be reduced if the mixture control is moved to "RICH" before making the shift.

(3) SHIFT FROM "LOW" TO "HIGH".

(a) Move supercharger control to the "HIGH" position. Then immediately retard the throttle to reduce the manifold pressure three or four inches before the high ratio clutches can engage.

(b) As soon as the high ratio clutches have engaged and the manifold pressure has stabilized, adjust the propeller control and throttle control to obtain the desired power.

(4) SHIFT FROM "HIGH" TO "LOW".

(a) Move supercharger control to the "LOW" position.

(b) As soon as the low ratio clutches have engaged and the manifold pressure has stabilized, adjust the propeller control and throttle control to obtain the desired power. Adjust mixture control as necessary.

Note

When making a military power climb, a shift can be made from low to high (before the required shifting altitude is reached) and the manifold pressure regulator (if installed) will automatically reset the manifold pressure to the required value without requiring a change in the position of the boost control.

e. SUPERCHARGER OPERATION—F8F-2.

(1) CHECKING AND DESLUDGING MANUALLY CONTROLLED SUPERCHARGER. — For F8F-2 airplanes equipped with a manually controlled supercharger, the following supercharger coupling check procedure is recommended:

(a) Altitude—3000 feet.

(b) Mixture—Optional.

(c) RPM—1600 constant.

(d) Throttle position—30 in. Hg.

(e) Shift the blower from "LOW" to "INTERMEDIATE" without altering the throttle setting; the manifold pressure should rise to approximately 33 in. Hg. Shift the blower to "HIGH" without altering the throttle setting; the manifold pressure should rise to approximately 36 in. Hg.

(2) It is recommended that desludging of the supercharger coupling be accomplished at intervals not exceeding 10 hours of operation. Follow the above procedure through two cycles and remain during each cycle, in intermediate and high ratios, for three minutes.

(3) CHECKING AND DESLUDGING AEC CONTROLLED SUPERCHARGER.—For F8F-2 airplanes equipped with an AEC unit, the following supercharger coupling check procedure is recommended:

(a) Altitude—10000 feet.

(b) Mixture—Optional.

(c) RPM—1500 constant.

(d) Throttle position—20-22 in. Hg.

(e) Move the throttle forward to obtain 30 in. Hg then move the throttle forward slowly to approximately one-half of the total quadrant travel. The manifold pressure will remain substantially constant for approximately 15 seconds and then jump to 34 in. Hg. This indicates a shift from low to intermediate impeller ratio. Again move the throttle forward slowly to open position. A lag in manifold pressure will be followed by a sudden rise to 36 in. Hg. This rise indicates that the high ratio coupling is now in operation.

(4) It is recommended that desludging of the supercharger couplings be accomplished at intervals not exceeding 10 hours of operation. Follow the above procedure through two cycles and remain during each cycle, in intermediate and high ratios, for three minutes.

f. COMBAT POWER (WEP)—F8F-2.—Upon completion of combat power evaluation tests for the R2800-30W engine, instructions for the use of the water injection system will be incorporated. Until such instructions are issued, keep the WEP switch in the "OFF" position.

g. AUTOMATIC ENGINE CONTROL (AEC) — F8F-2.—The automatic engine control (AEC) is utilized to regulate the throttle and the variable speed supercharger. With this system, manifold pressure regulation is accomplished entirely by one lever which replaces both the conventional throttle control and supercharger control. RPM and mixture are still regulated by conventional controls. This lever, called the boost control, is connected to the AEC which in turn actuates the carburetor throttle and a supercharger coupling oil valve. The opening of the oil valve determines the impeller ratio. When the pilot places the boost control at a certain position, he is actually setting the AEC so that the desired schedule of manifold pressure will be maintained. The AEC obtains this manifold pressure, first, by opening the carburetor throttle as required. After the throttle is fully open, the shift from low blower ratio to intermediate blower ratio is performed automatically, if low blower ratio will not deliver the scheduled performance. As required, to hold the scheduled performance, varying amounts of oil are directed to the intermediate coupling until the minimum slip condition for this coupling is reached. Then the oil is directed automatically

to the high blower ratio coupling which holds the selected manifold pressure until the minimum slip condition (critical altitude) is reached. After passing critical altitude for a selected manifold pressure and rpm, manifold pressure will fall off as with a fixed ratio impeller drive unless the engine rpm is increased. All this manifold pressure regulation is accomplished automatically by the automatic engine control without any repositioning of the boost control.

(1) OPERATION AT MILITARY POWER.—At military power (at altitudes below critical altitude for low impeller ratio) the AEC will open the carburetor throttle sufficiently to obtain military power manifold pressure. At higher altitude, the carburetor throttle is opened as needed to maintain this manifold pressure up to the critical altitude of low impeller ratio. Then the AEC will cause oil to be metered into the intermediate coupling, and if needed, to the high ratio coupling to maintain military power manifold pressure. However, the AEC is provided with an altitude unit which limits the maximum manifold pressure available at any particular altitude. When operating at military power, the manifold pressure will be reduced automatically as altitude increases according to the schedule provided within the AEC, up to the critical altitude for high impeller operation.

(a) During all operations at military power, adjustment of the boost control is not necessary because the control is at the full forward position at all times.

(2) OPERATION AT LESS THAN MILITARY POWER.—When operating below military power, the AEC will maintain essentially constant manifold pressure up to the critical altitude for that rpm and manifold pressure, provided that the selected manifold pressure is not greater than the limiting manifold pressure schedule at any particular altitude. This limiting schedule is that for military power manifold pressure at any given altitude. However, the pilot must select a manifold pressure that is permissible for the rpm used.

(3) OPERATION WITH WATER INJECTION. An automatic reset mechanism is provided within the AEC to reset the schedule of maximum allowable manifold pressures to a higher value when water injection is being used. In event of failure of the water supply, the control automatically drops back to the "dry" schedule.

(4) FORMATION FLYING. — In the case of formation flying where quick increases of manifold pressure may be called for, the AEC will respond immediately when operating at part throttle. When operating in the variable speed range, the response will be prompt when additional manifold pressure is called for. However, when operating at part throttle and the manifold pressure required necessitates the automatic shifting into the variable speed range, or from intermediate ratio to high ratio, there will be a time lag which may be shortened by moving the boost control to the full forward position and then retarding the lever to the position that will maintain the desired manifold pressure. Normally, this over-controlling will not be necessary, and except in the cases mentioned would produce undesirable surging of the manifold pressure.

(a) When cruising at the approximate coupling shift altitude for a selected manifold pressure and rpm, a small oscillation of manifold pressure may occur. This is due to "shuttling" or the rapid shifting back and forth from one coupling to another. This may be eliminated by a change in altitude or an alteration of the selected rpm or manifold pressure.

(b) When above the critical altitude for maximum high ratio, advancing of the boost control will not increase the manifold pressure since the carburetor throttle is already wide open and the impeller is turning at maximum ratio. Additional power can then be obtained only by increasing engine speed.

(5) ICING.—Icing in the induction system tends to reduce the manifold pressure causing the AEC to open the throttle if below the critical altitude for low ratio. It then meters oil to the intermediate ratio coupling (and high ratio coupling) in order to maintain the selected manifold pressure. Consequently, the operator may not have warning of this icing condition until after the throttle is fully opened and maximum high impeller ratio is reached. Decrease in airplane speed due to increased supercharging horsepower is an indication of this condition.

(6) EMERGENCY OPERATION OF THE AEC. —The pilot should be aware of the characteristics in order to be aware of the operating requirements if any failure should occur. Failure of the AEC will necessitate manual control of the manifold pressure within the limits allowed by the design of the unit. A sudden drop in the selected manifold pressure may indicate the failure of the oil supply to the engine control servo motor. The manifold pressure can be partially restored by moving the pilot's lever to the full forward (full open) position. This will give approximately 45 in. Hg at sea level at 2800 rpm. Less manifold pressure is available at altitude or with decreased rpm.

(a) A sudden rise in the selected manifold pressure may indicate the failure of the EVACUATED bellows within the control. This may be reduced to a minimum of about 35 in. Hg at sea level at 2800 rpm by retarding the pilot's lever until it is about 12 degrees open.

CAUTION

Further retarding of the pilot's lever causes the carburetor throttle to close suddenly to the minimum angle, giving approximately idling manifold pressure. Lower manifold pressure may be obtained at higher altitudes and with decreased rpm.

(b) Failure of the VENTED bellows, within the engine control, will react according to the extent of the damage. If it is slight such as a pin hole, the effect will be slight, but might lead to surging of the engine. Extensive failure of the bellows will cause an increase in manifold pressure if the manifold pressure is above atmospheric pressure at the time of the failure, and a decrease in manifold pressure if below atmospheric pressure. In this event, the desired power may be controlled by manual operation of the pilot's lever

h. CHANGING POWER CONDITIONS.—In order to prevent excessive pressures within the cylinders, the following procedures shall be used when changing power.

(1) INCREASING POWER.—Adjust propeller governor control to desired rpm, then adjust the throttle to obtain the desired manifold pressure.

(2) DECREASING ENGINE POWER .—Adjust throttle to desired manifold pressure, then adjust the propeller control to the desired rpm.

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

(1) Trim airplane for hands off level flight.

Note

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

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

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

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

(5) To bank without turning, push the controller lever to the left or right while depressing the button. Hold lever and button in position only until desired angle of bank is obtained (limit—45°).

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

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

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

(9) To overpower the automatic pilot, apply approximately twice the normal force on the airplane controls.

j. AUTOMATIC PILOT PERIODIC FLIGHT CHECK.

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

(2) Hold a selected heading for a minimum of 10 minutes. Check for drift, left or right, max ±1°.

(3) During banks to left and right, rate of roll should be approximately 5° per second. Check for smoothness of roll and co-ordination.

(4) Check operation in a climb at 100 knots and dive to 280 knots. Check combined climb and bank, and dive and bank.

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

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

Note

1.

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

2.

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

3.

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

4.

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

5.

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

6.

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

13. STALLS.

a. UNACCELERATED. — In general the stalling characteristics are good. The stall starts in the center section and progresses forward and outboard. In all cases the approach to the stall is made evident by an increase in the stick force although accompanied by only a relatively small amount of stick travel. Stall warning, in the form of elevator and rudder buffeting, occurs from three to ten knots above stalling speed. The buffeting is small in the clean condition; but when the flaps are extended and external items such as tanks and bombs are attached to the wings, it becomes more pronounced.

(1) Adequate directional and lateral control is present in the approach to and at the stall itself. The rudder is more effective in raising a wing with the flaps down than it is with the flaps retracted. Application of power usually makes the stall "break" more sharply and sometimes causes a moderate "roll-off" to the left. The stall recovery is rapid using a small amount of forward stick.

b. ACCELERATED.—Accelerated stall stability is very good. When the airplane is stalled with more than one g, a sharp buffet is felt and the airplane tends to recover itself; i.e., the nose falls without any rolling or wing dropping. Immediately after the nose falls the buffeting stops and the airplane resumes normal flying characteristics. It should be noted that the stall buffet comes on very sharply and stall pull-ups at maximum speeds should be avoided. As the speed increases the buffet is indicated several g's before the tremors become violent.

14. SPINS.

a. The airplane has been spun as follows in the most fore and aft cg positions:

(1) Five turns, right and left, clean condition.

(2) One turn, right and left, landing condition.

(3) One turn, right and left, inverted clean condition.

b. The airplane must be kicked into a spin as it will not fall easily into an incipient spin. Spinning to the right under all conditions is smooth, and spinning to the left is fairly jerky or violent. Inverted spins tend to "wind up" quite rapidly after one turn; however, all inverted spins should be recovered from as soon as possible by application of opposite control at the time of spinning. For upright spin recovery, reversal of the rudder immediately followed by movement of the stick sharply ahead of neutral will cause the quickest recovery. In other words, moving the stick ahead is far more effective than reversing the rudder for spin recovery. After spin rotation has stopped, do not recover immediately without allowing the airplane to pick up some speed because a slight *mushing* tendency will be felt. If this *mushing* tendency is felt, a slight application of power will aid in bringing the nose up to the horizon.

c. The spin characteristics of the F8F-2 airplane are the same as the F8F-1 except that higher stick forces are required for recovery.

Note

Although the airplane spins and recovers with no difficulty, it is not recommended that the airplane be spun intentionally.

15. PERMISSIBLE ACROBATICS.

a. All acrobatics with the exception of those listed in paragraph 1.*a.*, this section, may be performed. However, before starting any acrobatics or violent maneuvers, cage the gyro instruments and turn auxiliary fuel pump "ON".

16. DIVING.

a. For ordinary short dives in maneuvers, the engine nose section will not load up nor will the engine cool off to any extent.

(1) Canopy—CLOSED.
(2) Supercharger—"LOW" (F8F-1).
(3) Set propeller control—1900-2200 rpm.
(4) Mixture—"RICH".
(5) Fuel Selector—"MAIN TANK".
(6) Cowl flaps—"CLOSED".
(7) Oil cooler shutters—"CLOSED".

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

(1) Set propeller control to maximum cruising —2250±100 rpm.

(2) Set throttle—15-18 in. Hg.

c. MAX DIVING RPM.—3100 for 30 seconds.

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

(1) Throttle to "CLOSED".

(2) Propeller to "DECREASE RPM".

(3) Reduce airspeed to minimum speed for safe glide.

CAUTION

If manifold pressure regulator has not been installed, manifold pressure will build up rapidly at constant throttle setting during a prolonged dive. Retard throttle as necessary during the dive to prevent over-boosting. If a manifold pressure regulator is installed, any selected manifold pressure will be held automatically below critical altitude. If a dive is started above critical altitude, manifold pressure will build up until the critical altitude is reached, and will thereafter remain constant. In other words, the behavior of manifold pressure above critical altitude is the same, whether or not a manifold pressure regulator is installed.

e. HIGH SPEED DIVES.

(1) GENERAL.—In making high speed dives the operational pilot finds it difficult to remember the restricted speed and g for the particular altitude at which he is flying, and consequently finds it very difficult to fly the airplane to its maximum performance. It is also confusing to remember these qualifications under gun fire. In order to better acquaint the pilot with dive characteristics, the following limitations are presented:

(a) Below the speed limits shown by the vertical solid lines, figures 69 and 72, the airplane is fully controllable with the standard controls alone. Above these speeds the airplane exhibits a tendency to oscillate longitudinally and to "tuck under". These first manifestations are not dangerous but are a warning of impending full loss of longitudinal control with further increase in speed which will necessitate the use of the dive flaps for recovery.

(2) DIVE ENTRY.—Dives at angles from 0° to 30°, can be started from high speed level flight and full power from almost any altitude without running into any aerodynamic compressibility troubles. Dives of from 25° to 30° extended below 10000 feet might exceed the ultimate restricted speed of the airplane. Therefore, when prolonged dives are extended below 10000 feet, careful engine control should be maintained in order not to exceed the restricted speed of 425 knots IAS at any time.

(a) In dives of over 30° extreme care must be given to the method of entry. Half rolls and half loops have been done, starting from an altitude of 31000 feet at approximately 150 knots IAS. The half roll and the half loop at this altitude cannot be extended over 1000 or 2000 feet in an absolute vertical dive path before recovery must be made prior to running into compressibility troubles; therefore, overhead gunnery approaches from over 25000 feet should be carefully planned in order to execute the entry into a vertical dive from as slow a speed as possible. If the entry is 100 to 110 knots IAS, the half loop can be maintained from 2000 to 3000 feet in the vertical position prior to recovery.

WARNING

Steep dive entries from altitudes above 20000 feet should always be started from as slow a speed as possible.

(3) CONTINUED DIVING.—In prolonged dives up to 30°, the dive angle can be maintained by the use of the stick or the elevator tab control. Care should be exercised that the restricted manifold pressure limits of the engine are not exceeded.

(a) If a manifold pressure regulator has not been installed, it is very easy to pick up a large increase in manifold pressure in only a few thousand feet of diving because of the excellent ram effect. A similar increase in manifold pressure will occur even though a manifold pressure regulator is installed, if a dive is entered above critical altitude.

(b) In dives of over 30°, the air speed will increase quickly and will place the airplane in the compressibility range in a very short time. The first evidences of the compressibility effects are loss of elevator tab effectiveness; greatly increased elevator stick force tending to nose the airplane into a steeper dive angle; and finally, complete freezing of the elevator control. After the first nose-down tendencies of the airplane are felt, a large pull force on the elevator control will enable the pilot to make his dive path shallower. In very steep dives, the first tendencies will give the pilot only a very short time to appreciate the situation, and unless very quick realization is felt for his predicament, the elevator stick forces will be in the frozen condition before the pilot will have time to make use of the first symptoms of compressibility. When the airplane is in the compressibility range, and after the elevator control tab has lost its effectiveness, it will be of no avail to use this control. If the tab position is changed after the compressibility range was entered, excessive loads may be imposed on the airplane when the plane again comes out of the compressibility range.

WARNING

Do not use the elevator tab for control after the compressibility range has been entered.

(4) DIVE RECOVERY.—Starting from 15000 feet at approximately 100 to 110 knots IAS, vertical dives have been made up to 6000 feet in length. Using

a constant 5 g acceleration for recovery, the pull-out was begun at 350 knots IAS. Before the airplane had approached level flight in the pull-out, the airspeed increased to 415 knots IAS. This will serve as an example to show that recoveries from steep dives must be started well below the restricted speed to prevent exceeding that speed.

WARNING

Do not wait until compressibility effects are felt in steep angle dives and especially at high altitudes. If recoveries are withheld until the compressibility effects are felt, there will be insufficient control for proper recovery, and the recovery flaps may have to be used.

(5) DIVE RECOVERY FLAP ASSISTED PULL-OUTS.—If the pilot has neglected to heed the warnings of compressibility effects, the airplane may soon be entirely out of control, and use of the dive flaps will be imperative for recovery. *In all cases, the dive recovery flaps should be used immediately upon the loss of sufficient control for recovery.*

WARNING

Do not make prolonged dives in the compressibility range. When the dive recovery flaps are extended, the elevator control will tend to lose most of its frozen or stiff feeling, and the proper acceleration must be pulled by the pilot for a normal recovery. In all cases, after compressibility range has been entered, use the dive recovery flaps to assist recovery.

(a) When the dive recovery flaps are lowered prior to entering the compressibility range, the pilot does not need to use the stick for recovery. However, when the compressibility range has been entered, lowering of the dive recovery flaps will only neutralize most of the compressibility effects and the pilot must use the stick for recovery as in a normal pull-out. During such pull-outs, considerable buffeting will be experienced about the entire airplane, but under most circumstances no structural damage to the airplane will result from these maneuvers.

WARNING

Check the operation of the dive recovery flaps on the ground before all high altitude combat missions.

17. NIGHT FLYING.

a. Wear red goggles for ½ hour before each flight.

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

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

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

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

f. Use oxygen for all night flights.

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

18. APPROACH AND LANDING.

a. Reduce speed below 140 knots IAS then lower and lock landing gear—check gear position indicator. Maintain 100 knots IAS during a partial power approach (80-82 knot minimum IAS). Carrier approach speed—85 knots IAS (approx).

Note

Do not over-control with the elevator in landing.

b. CHECK-OFF LIST:

(1) Canopy—OPEN.
(2) Shoulder harness—TIGHT.
(3) Tabs control settings (approx).
(a) Aileron—0.
(b) Elevator—3 small marks "NOSE UP".
(c) Rudder—0.
(4) Auxiliary fuel pump—"ON".
(5) Tank selector—"MAIN".
(6) Mixture control—"RICH".
(7) Supercharger control—"LOW"—(F8F-1).
(8) Propeller control—2400-2600 rpm.
(9) Cowl flaps—as required.
(10) Oil cooler shutters—as required.
(11) Tail wheel — "LOCKED" (land) — "UNLOCKED" (carrier).
(12) Armament master switch—"OFF".
(13) Landing gear—"DOWN" and LOCKED.
(14) Wing flaps—"FULL DOWN". In turbulent air reduce setting accordingly.
(15) Arresting hook—EXTENDED—carrier.

c. A carrier wave-off can be taken easily at a few knots above stalling speed with a relatively small amount of power.

Note

External fuselage loads greater than 1100 lb must be dropped before carrier landing. Also, when arrested landings are made with external wing loads, fuselage loads greater than an empty tank must be dropped. Arrested landings with wing loads greater than 500 lb per side are not permitted.

d. NORMAL LANDING.

(1) GENERAL. — The recommended approach for a land landing should be made at from 10 to 20 knots above the stalling speed and with sufficient power to maintain a 500 to 1000 ft minimum rate of descent. This results in a moderate glide and ample speed for the flare out. Approaches made with the canopy open result in a slight loss in rudder effectiveness at small rudder deflections. The elevator is extremely effective in the approach and flare-out, and coupled with moderately light forces, it is very easy to over-control. During the touch down and ensuing ground run no tendency to drop a wing or to swing is evident.

(2) CROSS-WIND LANDING.—Landings have been made satisfactorily in 90° cross winds up to 50 mph. These can be made using the crabbing, lowering a wing, or angular approach technique or a combination of these methods. If runway length permits a wheel-type landing is recommended.

(3) MINIMUM RUN LANDING.—Because of the relatively large flap area and light weight of the airplane, the usual unbraked landing run is short. However, for a minimum run landing, the approach should be made with power at the power-off stalling speed followed by a full stall (3 point) landing. As the braking power is not excessive, the brakes can be applied vigorously after ground contact is made.

19. STOPPING OF ENGINE.

a. Propeller—Full "INCREASE RPM".

b. Supercharger Desludging—F8F-1.—Open throttle to approx 1400 rpm. Shift from "LOW" to "HIGH" and back to "LOW" — remaining in each position about one minute.

c. Operate engine at 1000-1200 rpm for 30 seconds.

d. Auxiliary fuel pump—"OFF".

e. Mixture control—"IDLE CUT-OFF".

f. Ignition switch—"OFF" (after engine stops).

g. Battery switch—"OFF".

h. Cowl flaps—"OPEN" until engine cools.

Note

If cold weather is anticipated at the next engine starting, operation of the oil dilution system may be required; if so, refer to Section VI, para 1.*u*.

CAUTION

Do not leave the throttle in the open position on F8F-2 airplanes which are equipped with an AEC unit. During cold weather oil will congeal in this unit and thus result in loss of engine control during the next start.

20. BEFORE LEAVING THE PILOT'S COCKPIT.

a. Install the controls locking device.

b. Check that all switches are in the "OFF" position except the generator switch.

21. MOORING.

a. GENERAL. — The airplane can be moored by using the forward towing fittings located on the main wheel axles as the forward tie down. The catapult hold back fitting is used as the aft tie down, and the tie down fittings provided on the shock strut trunnions as the outboard and aft tie downs. (See figure 39.)

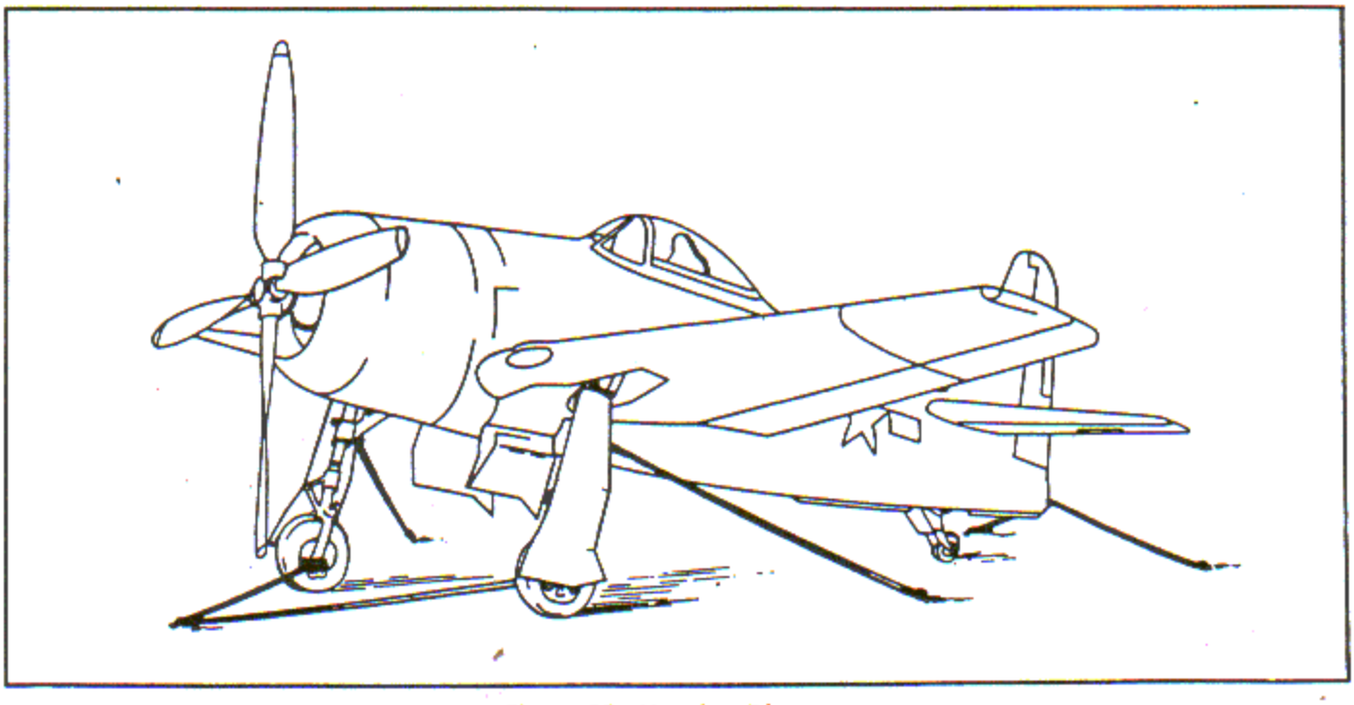


Figure 39—Mooring Diagram

SECTION III
OPERATING DATA

Note

Pitot located at wing leading edge. Static vents located adjacent to base of fuselage at sta 196.

CLEAN CONFIGURATION—SEA LEVEL

IAS-Knots	*Airspeed Error*	*Altitude Error Feet*
80	+9	+56
90	+6	+42
100	+3	+25
110	+1.5	+12
120	+1	+12
130	+1	
140	+1	
160	+1	
180	+1	
200	+1	
220	+0.5	
240	0.0	
260	−0.5	
280	0.0	
300	+1.0	

LANDING CONFIGURATION—SEA LEVEL

IAS-Knots	*Airspeed Error*	*Altitude Error Feet*
80	+1.5	+10
90	−2	−18
100	−1	−12
110	+1	+9
120	+1	+11

Note

Pitot located at wing mid-chord, lower surface. Static vents located adjacent to base of fuselage at sta 196.

CLEAN CONFIGURATION—SEA LEVEL

IAS-Knots	*Airspeed Error*	*Altitude Error Feet*
80	+1	+4
90	+1	+5
100	+1	+6
110	+1	+7
120	+1	+8
130	+1	
140	+1	
160	+1	
180	+0.5	
200	+0.5	
220	0.0	
240	+0.5	
260	+0.5	
280	+1.0	
300	+1.0	

LANDING CONFIGURATION—SEA LEVEL

IAS-Knots	*Airspeed Error*	*Altitude Error Feet*
80	−1	−5
90	−2	−14
100	−1.5	−14
110	+1	+7
120	+1	+11

Note

CLEAN CONFIGURATION

Wing flaps	Up
Landing gear	Up
Canopy	Closed
Cowl flaps	Closed
Oil cooler shutters	Closed

LANDING CONFIGURATION

Wing flaps	Down
Landing gear	Down
Canopy	Open
Cowl flaps	Closed
Oil cooler shutters	Closed

Figure 40—Airspeed Installation Correction Table

POWER PLANT CHART

AIRCRAFT MODEL
F8F- 1,-1B and -1N

PROPELLER
Aero Products Model No. A642-G1
Blade No. H-20C-156-5M5

ENGINE MODEL
R-2800-34W

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.
DESIRED MAXIMUM	22 23	75-95 100	60-85 95
MINIMUM IDLING	21 14	60 25	40(7)

MAXIMUM PERMISSABLE DIVING RPM: 3100

OIL GRADE: 1100 or 1120 Spec. AN-O-8
FUEL GRADE: 115/145 Spec. AN-F-48

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
FIVE MINUTES 260°C			FIVE MINUTES 260°C			TIME LIMIT MAX CYL HD TEMP			ONE HOUR Unlimited 260°C 232°C			UNLIMITED 232°C		
RICH 2800			RICH 2800			MIXTURE (3) R. P. M.			NORMAL 2600			NORMAL 2200		
MANIF. PRESS.	SUPER-CHARGER	FUEL (1) Gal/Min	MANIF. PRESS.	SUPER-CHARGER	FUEL (1) Gal/Min	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH (2)	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH (2)
						-55.0 -55.0 -55.0	40,000 FT. 38,000 FT. 36,000 FT.	-67.0 -67.0 -67.0						
			(8)F.T.	HIGH	1.9	-52.4 -48.4 -44.4	34,000 FT. 32,000 FT. 30,000 FT.	-62.3 -55.1 -48.0	(8)F.T.	HIGH	84	(8)F.T.	HIGH	57
			F.T. F.T. F.T.	HIGH HIGH HIGH	2.2 2.5 2.8	-40.5 -36.5 -32.5	28,000 FT. 26,000 FT. 24,000 FT.	-40.8 -33.7 -26.5	F.T. F.T. F.T.	HIGH HIGH HIGH	86 95 115	F.T. F.T. F.T.	HIGH HIGH HIGH	61 66 70
F.T. F.T. F.T.	HIGH HIGH HIGH	2.9 3.2 3.4	F.T. F.T. F.T.	HIGH HIGH HIGH	3.1 3.5 3.8	-28.6 -24.6 -20.7	22,000 FT. 20,000 FT. 18,000 FT.	-18.4 -12.3 - 5.2	F.T. F.T. 42	HIGH HIGH HIGH	134 149 165	F.T. F.T. 33	HIGH HIGH HIGH	76 81 88
F.T. F.T. F.T.	HIGH HIGH HIGH	3.7 4.0 4.3	49.5 49.5 49.5	HIGH HIGH HIGH	4.0 4.0 3.9	-16.7 -12.7 - 8.8	16,000 FT. 14,000 FT. 12,000 FT.	2.0 9.1 16.2	42 42 (5)F.T.	HIGH HIGH LOW	164 163 145	33 (6)F.T. 32	HIGH LOW LOW	87 90 91
70 70 70	HIGH HIGH HIGH	4.8 4.9 4.4	(4)F.T. F.T. F.T.	LOW LOW LOW	3.5 3.9 4.2	- 4.8 - 0.8 3.1	10,000 FT. 8,000 FT. 6,000 FT.	23.4 30.5 37.4	F.T. 41 41	LOW LOW LOW	164 172 170	32 32 32	LOW LOW LOW	89 88 87
F.T. F.T. F.T.	LOW LOW LOW	4.1 4.4 4.7	F.T. F.T. 58	LOW LOW LOW	4.5 4.6 5.1	7.1 11.0 15.0	4,000 FT. 2,000 FT. SEA LEVEL	44.7 51.8 59.0	41 41 41	LOW LOW LOW	168 166 163	32 32 32	LOW LOW LOW	85 83 80

GENERAL NOTES

(1) Gal/Min: Approximate US Gallon per minute.
(2) GPH: Approximate US Gallon per hour.
F.T.: Means full throttle operation.
Values are for level flight with ram.

FOR COMPLETE CRUISING DATA SEE APPENDIX II
NOTE: TO DETERMINE CONSUMPTION IN BRITISH IMPERIAL UNITS, MULTIPLY BY 10 THEN DIVIDE BY 12.

TAKE-OFF CONDITIONS: Cyl Hd Temp - 260°C
Mixture - Rich
Propeller - 2800 RPM
Low Blower
Manifold Pressure - 58 in. Hg.
For Grade 100/130 fuel, manifold pressure is limited to 53.5 in. Hg.

CONDITIONS TO AVOID:

SPECIAL NOTES

(3) Use RICH for all operation above 2600 RPM. Use NORMAL for flight operation at 2600 RPM and below, provided cylinder head temperature limits are not exceeded.
(4) Shift to High Blower when manifold pressure drops to 41 in.Hg.
(5) Shift to High Blower when manifold pressure drops to 36 in.Hg.
(6) Shift to High Blower when manifold pressure drops to 30 in.Hg.
(7) Minimum oil temperature for normal take-off.
(8) When using Grade 100/130 fuel, military power is limited to 53.5 in. Hg. Normal rated and max cruise is the same as for Grade 115/145 fuel.

AAFMC-526
8-1-48

DATA AS OF 7-1-49 (Revised 10-25-49) BASED ON AEL Calibration

Figure 41—Power Plant Chart—F8F-1 (R-2800-34W)

POWER PLANT CHART

AIRCRAFT MODEL
F8F-2, -2N, -2P

ENGINE MODEL
R2800-30W

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.
DESIRED MAXIMUM	24 25±1	90-100 120±5	85°C 100°C
MINIMUM IDLING	24 14	40 40	40°C

MAXIMUM PERMISSABLE DIVING RPM: 3160 (3)
MINIMUM RECOMMENDED CRUISE RPM:
MAXIMUM RECOMMENDED TURBO RPM:

OIL GRADE: 1100 Spec AN-0-8
FUEL GRADE: 115/145 Spec AN-F-48

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
MINUTES			30 MINUTES 260°C			TIME LIMIT MAX. CYL. HD. TEMP.			1/2 hr Unlimited 248°C 232°C			UNLIMITED 232°C		
			NORMAL (4) 2800			MIXTURE R. P. M.			NORMAL (4) 2600			NORMAL (4) 2200		
MANIF. PRESS.	SUPER-CHARGER	FUEL(1) Gal/Min	MANIF. PRESS.	SUPER-CHARGER	FUEL(1) Gal/Min	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH(2)	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH(2)
			FT(6) FT FT	(5)	1.5 1.9 2.6	-55.0 -55.0 -55.0	40,000 FT. 38,000 FT. 36,000 FT.	-67.0 -67.0 -67.0	(6)	(5)		(6)	(5)	
			FT FT FT		3.0 3.4 3.8	-52.4 -48.4 -44.4	34,000 FT. 32,000 FT. 30,000 FT.	-62.3 -55.1 -48.0	FT FT FT		110 132 146	FT		64
			FT FT FT		4.3 4.7 5.0	-40.5 -36.5 -32.5	26,000 FT. 26,000 FT. 24,000 FT.	-40.9 -33.7 -26.5	FT FT 44.0		158 170 180	FT FT FT		73 76 80
			FT FT FT		4.9 4.9 4.9	-28.6 -24.6 -20.7	22,000 FT. 20,000 FT. 18,000 FT.	-19.4 -12.3 - 5.2	44.0 44.0 44.0		180 172 176	FT FT FT		81 82 84
			FT FT FT		4.8 4.8 4.8	-16.7 -12.7 - 8.8	16,000 FT. 14,000 FT. 12,000 FT.	2.0 9.1 16.2	44.0 44.0 44.0		175 178 180	FT FT FT		87 87 89
			FT FT FT		4.8 4.8 4.8	- 4.8 - 0.8 3.1	10,000 FT. 8,000 FT. 6,000 FT.	23.4 30.5 37.6	44.0 44.0 44.0		180 177 184	33.5 33.5 33.5		89 88 86
			FT FT ! 58.6		4.8 4.8 4.8	7.1 11.0 15.0	4,000 FT. 2,000 FT. SEA LEVEL	44.7 51.8 59.0	44.0 44.0 44.0		180 180 178	33.5 33.5 33.5		84 81 80

GENERAL NOTES

(1) Gal/Min: APPROXIMATE U.S. GALLON PER MINUTE PER ENGINE
(2) GPH: APPROXIMATE U.S. GALLON PER HOUR PER ENGINE.
F.T.: MEANS FULL THROTTLE OPERATION.

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

TAKE-OFF CONDITIONS: Mixture - Rich, Cyl.Temp. -248°C
Manifold pressure - 60 in.Hg., Prop.- 2800 RPM.
When using grade 100/130 fuel T.O. is limited to 55 in.Hg.

CONDITIONS TO AVOID: See Note (7)

SPECIAL NOTES

(3) When supercharger is in full high ratio (full throttle position) RPM is limited to 2860.
(4) If Cyl. Hd. Temp. limits cannot be maintained, use rich mixture.
(5) Variable Speed.
(6) When using grade 100/130 fuel limits are as follows:
Military power - 55 in. Hg.
Normal rated, max cruise and below - same as for grade 115/145 fuel.
(7) Engine surge caused by supercharger instability may be encountered at cruise powers at intermediate and high altitudes. Increasing RPM and / or throttle setting will eliminate this condition.

DATA AS OF 21 Oct. 49 BASED ON AEL calibration data of June 1949

AAFMC-326
4-1-49

Figure 42—Power Plant Chart—F8F-2 (R-2800-30W)

LIST OF REVISED PAGES ISSUED

INSERT LATEST REVISED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the current revision is indicated by a vertical line in the outer margins of the page.

* The asterisk indicates pages revised, added or deleted by the current revision.

BuAer

ADDITIONAL COPIES OF THIS PUBLICATION MAY BE OBTAINED AS FOLLOWS:

USAF ACTIVITIES.—In accordance with Technical Order No. 00-5-2.
NAVY ACTIVITIES.—Submit request to nearest supply point listed below, using form NavAer-140; NAS, Alameda, Calif.; ASD, Orote, Guam; NAS, Jacksonville, Fla.; NAS, Norfolk, Va.; NASD, Pearl City, Oahu; NASD, Philadelphia, Pa.; NAS, San Diego, Calif.; NAS, Seattle, Wash.
For listing of available material and details of distribution see Naval Aeronautics Publications Index NavAer 00-500.

SECTION IV
EMERGENCY OPERATING INSTRUCTIONS

1. FIRE.

a. If flying low, climb to a safe altitude, trim airplane and BAIL-OUT, or land if safer.

b. If an electrical fire, cut electrical power to affected unit.

c. Place the propeller in full "DECREASE RPM" position.

d. Throttle "CLOSED". Closing the throttle and increasing the pitch will assist in reducing engine speed as rapidly as possible. Stoppage or reduction of engine rotation is an important step in extinguishing fires, as it reduces the probability of the engine pumping inflammable materials such as fuel and oil from a broken line into the engine compartment.

e. Ignition switch—"OFF".

f. Mixture control—"IDLE CUT-OFF".

g. Fuel selector valve to "OFF".

h. Oil cooler shutters and cowl flaps "OPEN".

2. ENGINE FAILURE DURING FLIGHT.

a. GENERAL.—Check tank selector valve, auxiliary fuel pump, and fuel quantity gage as failure may be due to an empty tank.

3. FORCED LANDING.

a. ON LAND.

(1) Nose down to maintain flying speed—110 knots IAS, flaps down; 120 knots IAS, flaps up.

(2) Jettison external load items—"SAFE" armament units before release. Rockets cannot be released in a safe condition.

(3) Shoulder harness—TIGHT.

(4) Release cockpit canopy—pull emergency release handle. Lower head to prevent injury in case it does not clear properly when leaving the airplane.

(5) Lower wing flaps partially, saving the full "DOWN" position for the final approach only after making certain that the selected field can be reached.

(6) If time permits:

(a) Ignition switch—"OFF".

(b) Battery switch—"OFF".

(c) Mixture control—"IDLE CUT-OFF".

(d) Fuel selector valve—"OFF".

(7) If the landing must be made on soft or rough ground, retract landing gear.

b. ON WATER.—The emergency procedure for a landing on water is essentially the same as that for on land except that the landing gear *MUST* be "UP"

(1) Smooth sea—land into the wind.

(2) Rough sea—land along trough of swell—across wind if necessary.

(3) Make a power stall landing with the flaps full "DOWN".

4. EMERGENCY ESCAPES FROM AIRPLANE.

a. Disconnect headphones and oxygen tube.

b. Pull the red T handle, at the top of the canopy, STRAIGHT AFT.

c. Push canopy up at top forward edge. Lower head to prevent injury in case canopy does not clear properly when leaving the airplane.

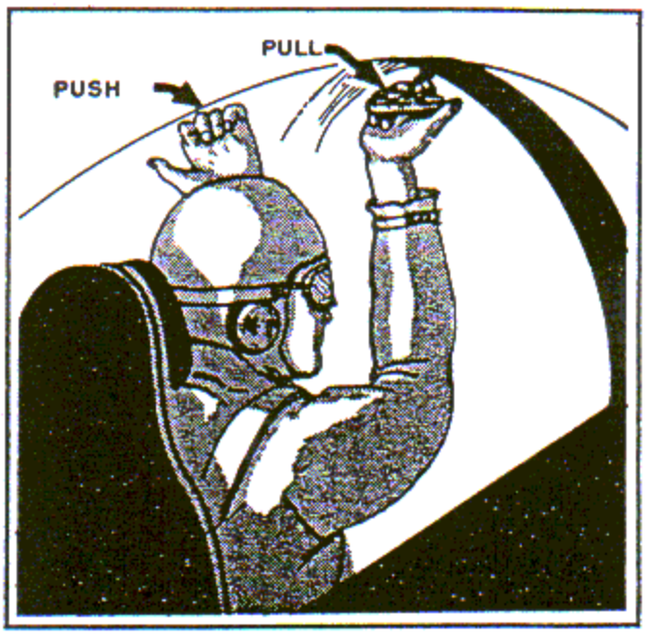


Figure 43—Canopy Emergency Release

5. EMERGENCY OPERATION OF ELECTRICAL SYSTEM.

a. HIGH VOLTAGE (over 30.0 volts)—Turn the generator emergency switch "OFF" in order to prevent the burning out of electrical equipment, and use only the electrically operated equipment essential for flight. Recharge the battery periodically by closing the generator emergency switch for not more than five minutes at a time, making sure to turn off electrical equipment likely to be damaged by the excessive voltage during the charging.

b. LOW VOLTAGE (below 26.0 volts).—If the voltmeter reading is below 26.0 volts, immediately

turn off all equipment requiring heavy electrical loads. Then turn off the battery switch to determine if the generator system is operating properly. If light electrical loads such as cockpit lights and instruments continue to operate, the reverse current cut-out has not opened and the generator is still supplying current to the battery. If the lights and instruments cease to operate, it is an indication that the reverse current cut-out has opened and that the battery is the sole source of electric power. In that case, conserve the battery by using electrically operated equipment as sparingly as possible.

c. ELECTRICAL FIRE.—If the faulty circuit is known, turn off the proper switch. If the faulty circuit is not known, turn off the battery switch and the generator emergency switch until the fire is extinguished. Turn off all electrical switches, then turn switches on one at a time until the faulty circuit can be determined by a new outbreak of the fire.

6. EMERGENCY OPERATION OF HYDRAULIC SYSTEM.

a. GENERAL.—If there is insufficient hydraulic pressure to operate any of the various systems due to line failure or malfunctioning of the engine driven pump, the hand pump should be used to supply pressure to the systems. Rotate the hand pump selector lever to the system being operated. "SYSTEM" position operates oil cooler shutters, dive recovery flaps, and the gun chargers.

Note

In the event of a hydraulic system failure due to a leak or break in the line or unit, the hydraulic oil in the reservoir is not entirely pumped overboard by the engine driven pump. There is a reserve in the reservoir which is sufficient to lower the landing gear once and also to lower, raise and again lower the wing flaps by using the hand pump.

b. LANDING GEAR.

(1) If the wheels fail to extend when the landing gear control lever is moved to the "DOWN" position, use the following procedure:

(a) Check landing gear control for "DOWN" position.

(b) With an airspeed of less than 120 knots, impose a slight negative "g" on the airplane and pull the emergency landing gear release (red "T" handle located on the right side of the main instrument panel). The main wheels should unlock from the up position, drop to an intermediate position, and show a "barber pole" condition on the landing gear position indicator.

(c) Rock the airplane from side to side to lock the main wheels in the down position.

(d) If the landing gear position indicator does not indicate down and locked after following above steps, the hydraulic hand pump selector lever should be set on "LANDING GEAR" and the hand pump operated until the indicator indicates down and locked.

Note

Pulling the emergency landing gear release handle mechanically releases the landing gear up locks and opens a dump valve which allows the hydraulic fluid trapped in the landing gear actuating cylinders to escape back into the system. The main landing gear then drops by its own weight into the down position. Since the tail wheel is held in the up position by system pressure against a spring release, loss of hydraulic pressure automatically results in extension of the tail wheel.

(2) If, inadvertently, slack has been left in one of the landing gear up lock cables, pulling the emergency "T" handle will not drop the gear. It may be extended as follows:

(a) Landing gear control lever in "UP" position.

(b) With an airspeed of less than 120 knots, impose a slight negative "g" on the airplane and pull the emergency "T" handle aft. Hold the emergency "T" handle in the aft position and move the landing gear control handle from "UP" to "DOWN" position. The main wheels should unlock from the up position, drop to an intermediate position, and show a "barber pole" condition on the landing gear position indicator.

(c) Rock the airplane from side to side to lock the main wheels in the down position.

(d) If the landing gear position indicator still does not indicate down and locked, the hand pump selector lever should be set on "LANDING GEAR" and the hand pump operated until the indicator indicates down and locked.

Figure 44—Landing Gear Emergency Control

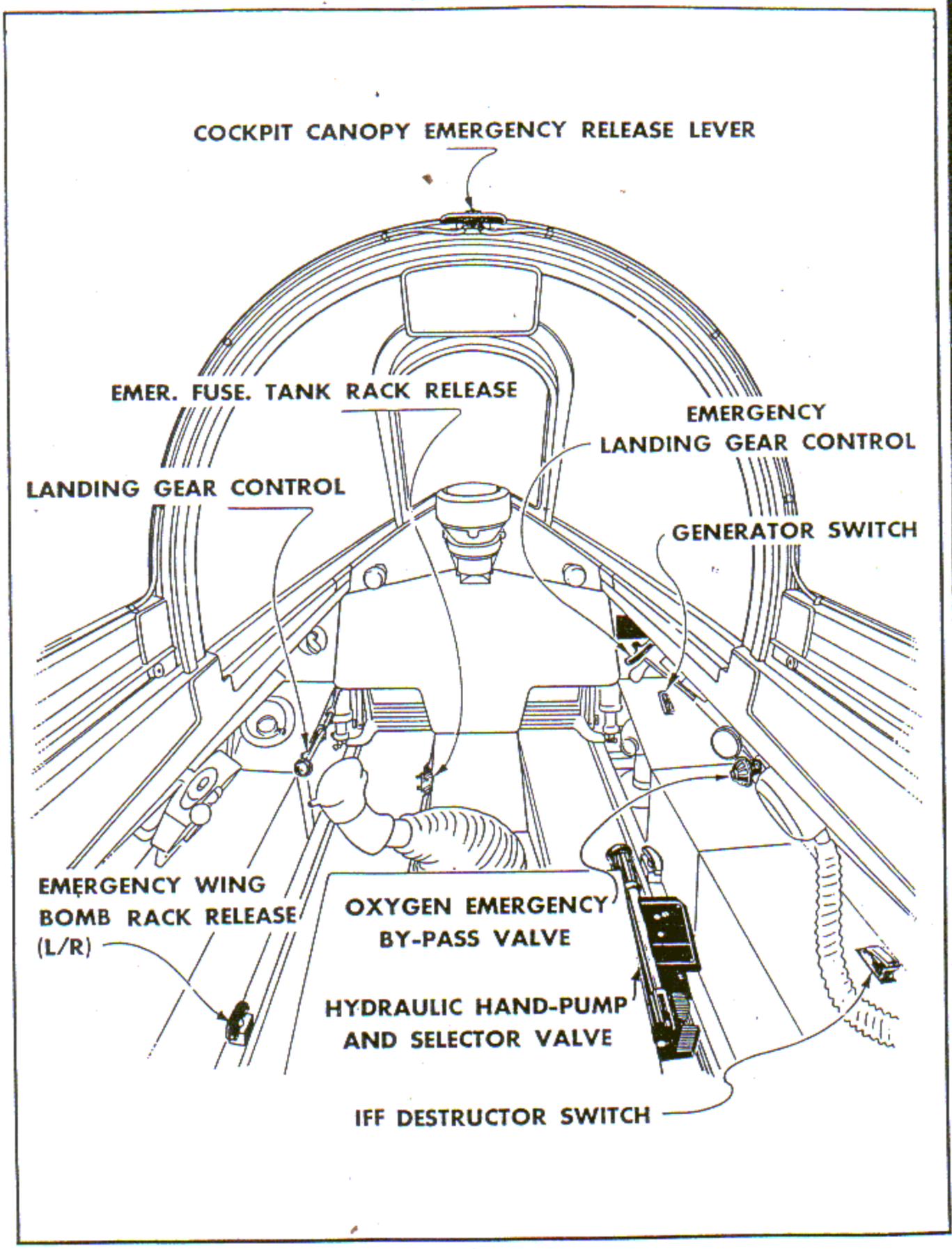


Figure 45—Emergency Controls

(3) The landing gear may be raised or lowered by operating the hand pump.

(a) Landing gear control lever—"DOWN" or "UP" as required.

(b) Hand pump selector lever—"LANDING GEAR".

(c) Operate hand pump while maintaining minimum airspeed for safe flight. Approximately 225 single strokes are required to lower and lock wheels from the up position.

c. WING FLAPS.

(1) Set control lever to "15°", "30°", or "DOWN" as desired.

(2) Move the hand pump selector lever to "WING FLAPS".

(3) Operate hand pump. If the system is tight, flaps will extend after eight or ten double strokes. Refer to Section II, Paragraph 1.*a.* (6). for speed limitations relative to flap operation.

d. OIL COOLER SHUTTERS.

(1) Oil cooler shutters control lever "OPEN" or "CLOSED" as desired.

(2) Set hand pump selector lever on "SYSTEM".

(3) Operate hand pump.

e. DIVE RECOVERY FLAPS.

(1) Dive recovery flap control to "UP" or "DOWN" as desired.

(2) Hand pump selector lever to "SYSTEM".

(3) Operate hand pump.

f. GUN CHARGERS.—Refer to Section V, Paragraph 1.*a.* (5).

7. EMERGENCY OPERATION OF IFF EQUIPMENT.

a. TO SHOW DISTRESS.—Rotate CODE control to full clockwise position lifting safety latch labeled "PUSH" so that control may be advanced and set on "EMERGENCY" position.

b. TO DESTROY RECEIVER-TRANSMITTER.—Raise red guard labeled "DESTRUCT" breaking safety wire and move switch handle to "ON".

8. OXYGEN SYSTEM EMERGENCY OPERATION.

a. Should symptoms occur suggestive of the onset of anoxia, or the regulator become inoperative, immediately turn on the emergency valve and descend below 10,000 feet. Whenever excessive carbon monoxide or other noxious or irritating gas is present or suspected, then regardless of the altitude the air valve should be set at "100% Oxygen" and undiluted oxygen used until danger is past or flight completed.

b. Should brief removal of the mask from the face be necessary at high altitude, use the following procedure:

(1) Take three or four deep breaths of undiluted oxygen (air valve set at 100% Oxygen).

(2) Hold breath and remove mask from face.

(3) As soon as practicable, replace mask to face, and take three or four deep breaths of undiluted oxygen.

(4) Reset air valve to "Normal Oxygen".

SECTION V
OPERATIONAL EQUIPMENT

1. ARMAMENT.

a. GUNS.

(1) GENERAL. — F8F-1 and -1N airplanes are equipped with four .50 cal machine guns installed in the wing center section, two left and two right, with 200 rounds of ammunition for each outboard and 325 rounds for each inboard gun. The F8F-1B and-2 series airplanes are equipped with four 20 mm M-3 guns installed in the wing center section, with 225 rounds for each inboard and 188 rounds for each outboard gun. The guns are charged hydraulically and fired electrically by a switch installed on the control stick grip. The armament master switch and the gun selector switches are located to the left of the gun sight.. The gun charger control handles, one for left wing guns and one for right wing guns, are located at the base of the main instrument panel. Provision is made for the installation of an electric heater for each gun. Only the two inboard guns are installed in the F8F-2P airplanes.

Note

1.

The gun heater circuit is connected directly to the generator through circuit breakers, and the heater will be energized whenever the generator is operating. The battery will not energize the heaters. The plugs must be pulled to prevent the heaters from operating when the engine is running.

2.

An armament safety switch is located on the arresting hook carriage track and short circuits the master armament circuit when the arresting hook is lowered.

(2) TO CHARGE GUNS.

(a) Rotate gun charging handle pointers to UP (CHARGE) position.

(b) Push handles FULL IN. Handles will automatically release, springing out when the guns are charged.

(c) Turn handle COUNTERCLOCKWISE 90° to SAFETY position.

(3) TO SAFETY GUNS.

(a) Rotate handle pointers COUNTERCLOCKWISE 90° to SAFETY position.

(b) Push handles FULL IN. Handles will remain in position.

(4) TO CHARGE FROM SAFETY POSITION.

(a) Rotate handles CLOCKWISE to UP (CHARGE) position. The handles will then release automatically.

(b) Push handles FULL IN. The handles will release automatically when the guns are charged.

(5) AUXILIARY OPERATION OF GUN CHARGERS.—If the engine-driven hydraulic pump is not operating, the gun chargers may be operated by means of the hand pump with the hand pump selector lever on "SYSTEM". The procedure is the same as that outlined above in paragraphs (2), (3) and (4).

(6) TO FIRE GUNS.

(a) Gun selector switch or switches—"ON".

(b) Armament master switch—"ON".

(c) Press gun trigger switch on control stick grip.

b. BOMBS.

(1) GENERAL.—A MK 51 bomb rack is installed on each side of the center section. The following bomb loads can be carried on the wing racks:

(a) Two MK 4 droppable tanks (100 gal).

(b) Two 500 lb or 1000 lb bombs.

(c) One or two 250 lb bombs.

(d) Bomb control switches, shackle selectors, bomb selector and arming switches are installed to the right of the gun sight, and the bomb release button is installed on the control stick grip. Manual bomb release controls are installed in later model airplanes on the cockpit floor on either side of the pilot's seat.

Note

1.

An unsymmetrical wing load must not exceed 250 pounds. For low speed flight see Section II, paragraph 1*(a)*.

2.

The fuselage MK 51 bomb rack is to be used for a droppable fuel tank or trimetrogon camera capsule only.

(2) TO RELEASE BOMBS.

(a) RP — Bombs and Drop Tanks Selector Switch—"BOMBS and DROP TANKS" (early models only).

(b) Switch for bomb or bombs to be dropped —"ON".

(c) Bombs are set for impact burst by putting the arming switch to "NOSE and TAIL ARMING", and for delayed burst by putting the arming switch to "TAIL ARMING". Center position is "SAFE".

(d) Armament master switch—"ON".

(e) Press bomb button on stick grip.

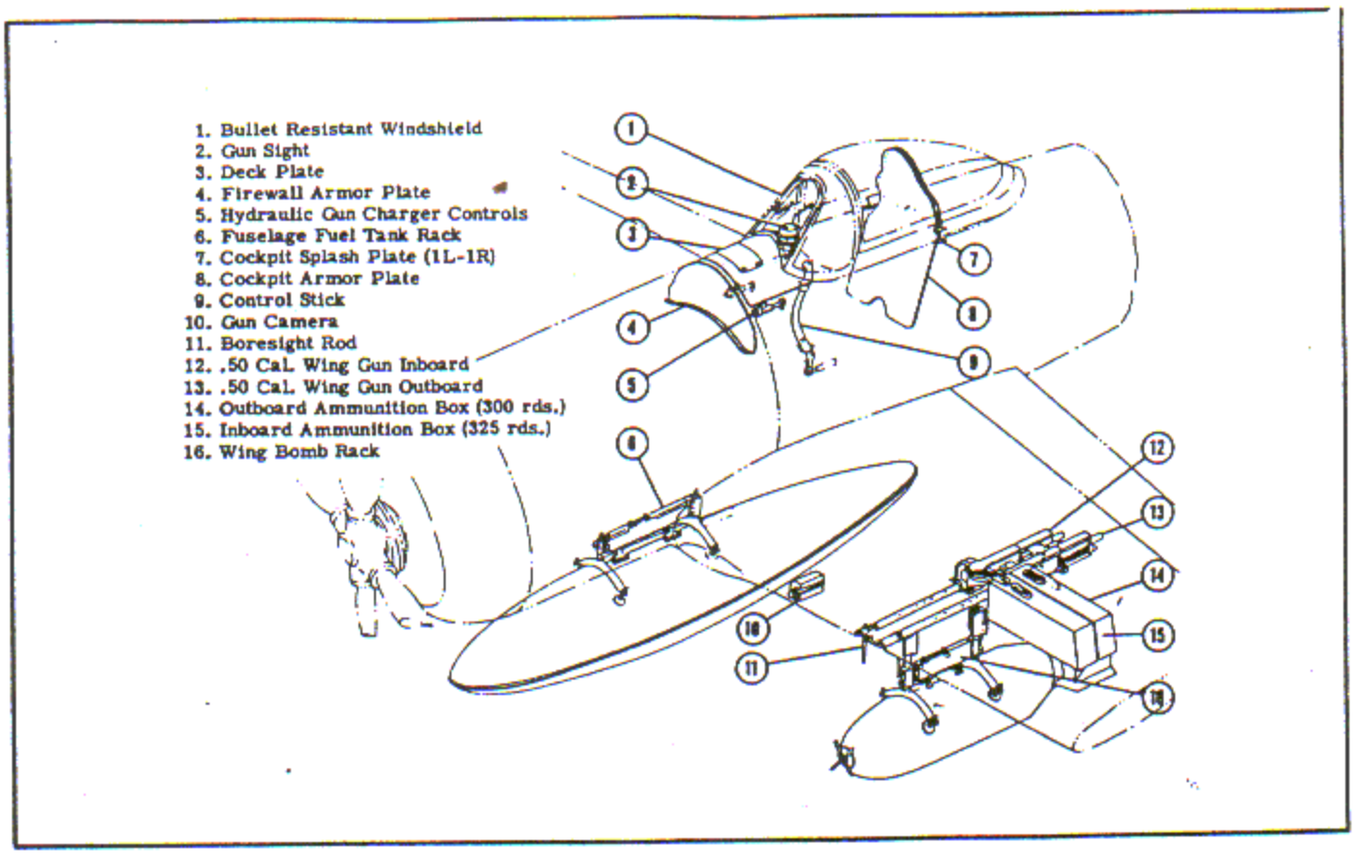


Figure 46—Armament Installation—Early Models

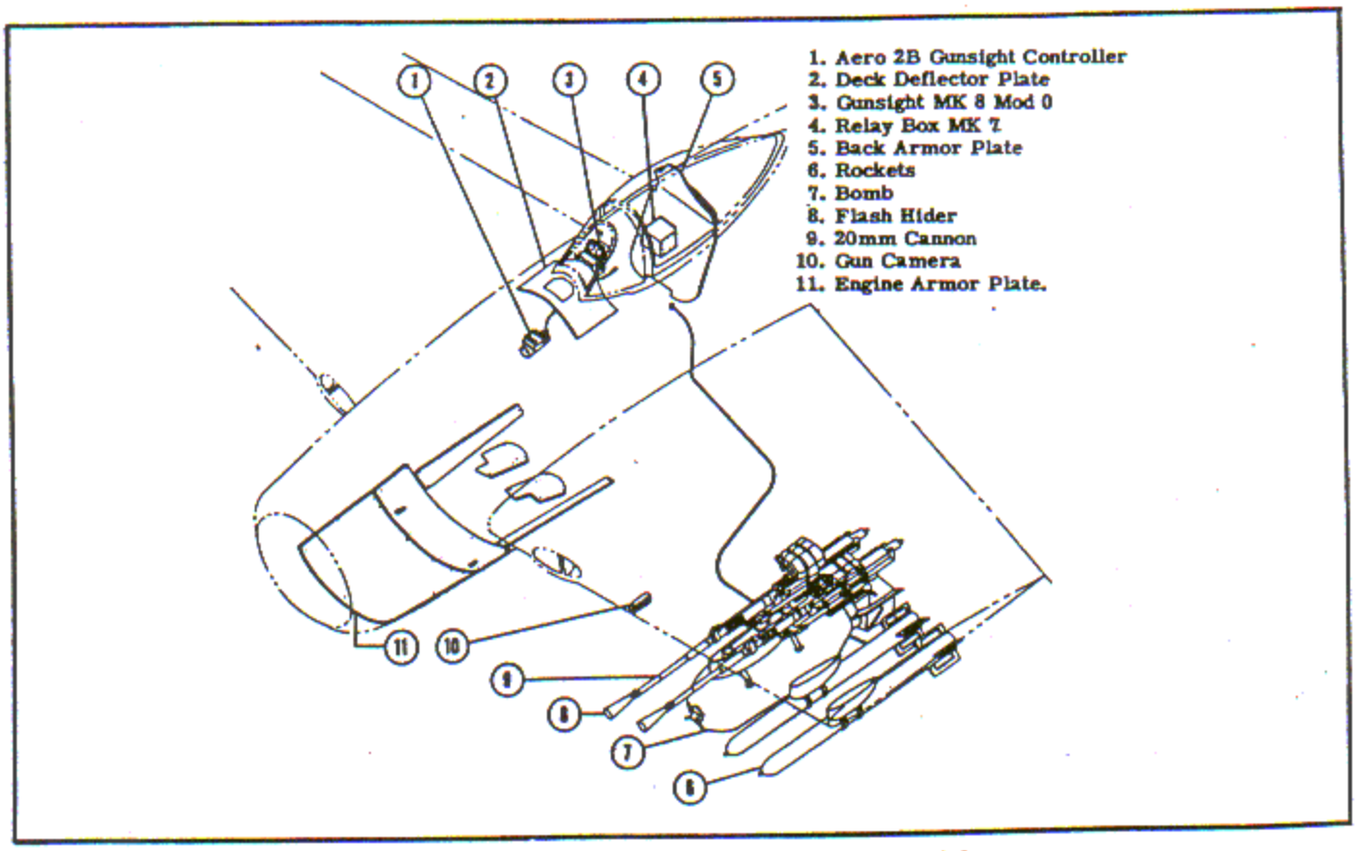


Figure 47—Armament Installation—Later Models

c. ROCKETS.

(1) GENERAL.—Provision is made for installing four MK 9 rocket pylons on the under side of the center section, two left and two right, adjacent to the folding axis. Four AR HVAR's can be installed on these pylons. The rockets are armed and fired only by electrical control. Rockets cannot be released in the safe condition.

(2) TO FIRE ROCKETS.

(a) RP—Bombs and Drop Tanks selector switch —"RP" (early models).

(b) Rockets are set for impact burst by putting the arming switch to "NOSE and TAIL ARMING", and delayed burst by turning the arming switch to "TAIL ARMING".

(c) Number of rockets to be fired and sequence is controlled by setting the MK 1 Rocket Selector Switch mounted on the fuel control panel.

(d) Armament master switch—"ON".

(e) Press bomb button on stick grip (early models). Press rocket button on stick grip (later models).

WARNING

Do NOT push SALVO PRESET as the instantaneous firing of four rockets places an excessive strain on wings.

(3) F8F-2 airplanes are equipped with a MK 2 rocket selector switch which permits firing rockets in singles or pairs. A three trigger switch provides a separate trigger for rockets and eliminates the use of the bomb switch to fire rockets.

(4) To fire singles set the "SELECTOR" switch to "1" and press the rocket trigger. (Armament Switch must be "ON"). Proceed to set the SELECTOR progressively, "2" fire, "3" fire and "4" fire.

(a) The order of release is as follows:

SINGLES

1 Left Outb'd
2 Right Inb'd
3 Right Outb'd
4 Left Inb'd

PAIRS

3 Both Outb'ds
4 Both Inb'ds

(5) To fire pairs set the "SELECTOR" switch to "3" or "4" and proceed as above.

Note

A SALVO can not be fired.

d. GUN CAMERA.—An AN-N6-A gun camera is installed in the leading edge of the left wing. The camera will operate whenever the armament master switch is "ON" and either the gun trigger or rocket button on the stick grip is pressed.

e. GUN SIGHTS.

(1) GENERAL.—Three different type sights are used. Early model day fighters were equipped with a MK 8 Mod 6, while later models are equipped with a computing sight unit MK 8 Mod 0. Night fighters are equipped with a MK 20 Mod 0 sight.

(2) The MK 8 Mod 6 is a simple fixed reticle sight. A two filament lamp within the gunsight illuminates and projects deflection rings and cross hairs upon the windshield.

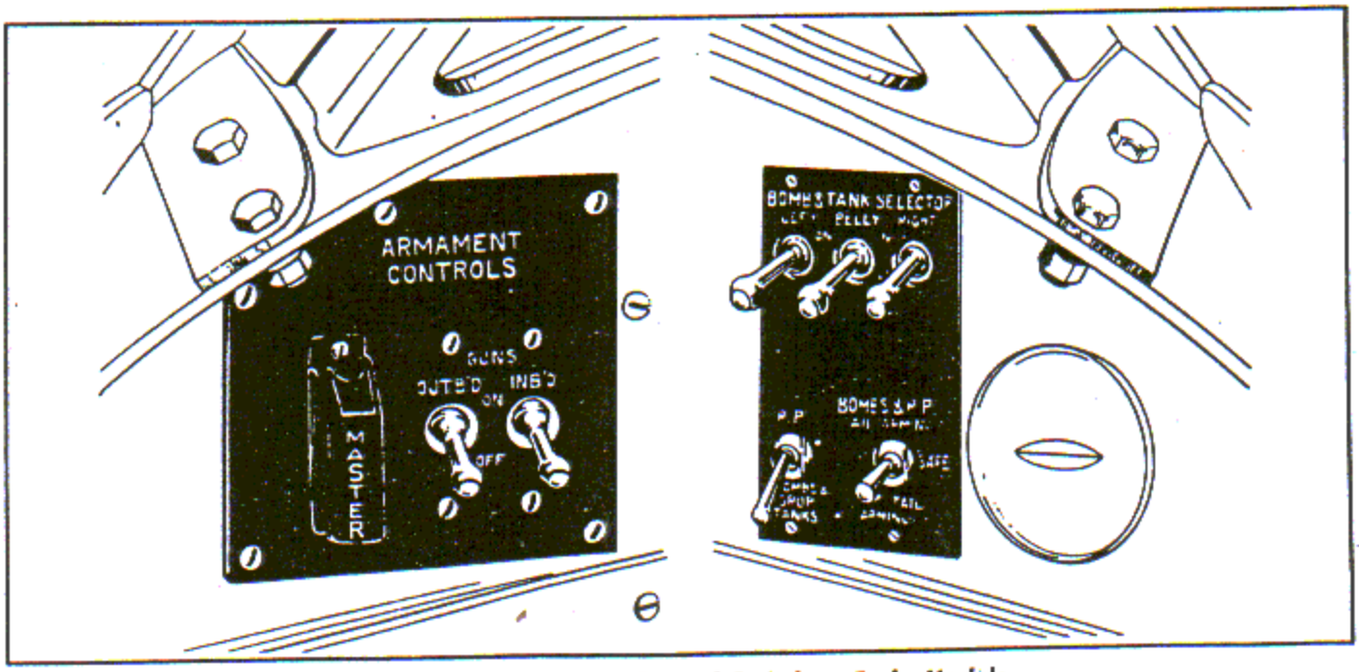


Figure 48—Armament Control Switches—Early Models

(3) OPERATION. — The two filament lamp is controlled by a switch which may be placed in "ON" or "ALTERNATE" enabling the pilot to switch to the second filament should one burn out in flight. The intensity of the light is controlled by a rheostat. Both switch and rheostat are located on the left hand side of the gun sight.

(a) The MK 20 Mod 0 sight closely resembles the MK 8 Mod 6, except that a small knob at the top permits the pilot to use one of three reticle images; otherwise its operation is the same as the MK 8 Mod 6.

f. AIRCRAFT FIRE CONTROL MK 6.

(1) GENERAL DESCRIPTION. — This system provides a gyroscopically controlled sight line to provide gun lead in high speed gunnery operation. With this system the pilot's problem is simplified to aiming the aircraft so that the reticle image remains on the target and following the sight line to the target until the attack has been completed. It may be used as either a fixed or compensating sight. The system consists of six major units.

(a) GUNSIGHT.—A MK 8 Mod 0 illuminated, gyroscopic, range-finding sight unit is mounted on the airplane instrument panel. The control switch and rheostat are located on the left console. The lamps and mirrors within the gunsight illuminate and project deflection cross hairs and ranging images on a reflector plate.

1. GUNSIGHT RECORDER CAMERA:—A 16 mm Fairchild CG-4 gunsight recorder camera may be mounted above the gunsight. This camera takes a picture downward, so as to obtain a picture of the image on the reflector plate. It will operate whenever the armament switch is "ON" and either the gun trigger or rocket button on the stick grip is pressed. Before each flight the following checks should be made:

a. Check the film footage indicator to see that sufficient unused film remains in the camera. To reload the camera pull the lock plunger out and rotate the camera outward (the mount swivels) so that the film magazine may be replaced. When a new magazine is installed reset the film footage indicator to zero.

b. The exposure should be set in accordance with the brightness of the reticle image and the weather.

c. The shutter speed should be set as desired.

CAUTION

Never make speed changes when the camera is running.

Note

Day fighters carrying the MK 8 Mod 0 sight unit, also carry provisions for the CG-4 gunsight recorder.

(b) CONTROLLER.—An Aero 2B controller is mounted on the airplane centerline in the toe pocket of the cockpit. It eliminates the necessity of cables, pulleys etc. from the throttle handle to the range unit of the sight unit. It is connected by a flexible shaft to the sight unit ranging dial and electrically to the throttle ranging grip.

(c) RELAY BOX.—A MK 7 Mod 0 relay box is mounted on the right cockpit shelf. The relays supply electrical energy in accordance with the attack plans and are controlled by the armament switches located on the instrument panel.

(d) VOLTAGE REGULATOR.—A MK 1 Mod 0 voltage regulator supplies a current of smooth flow and constant voltage to the sight unit and prevents fluctuation of the gyro motor speed.

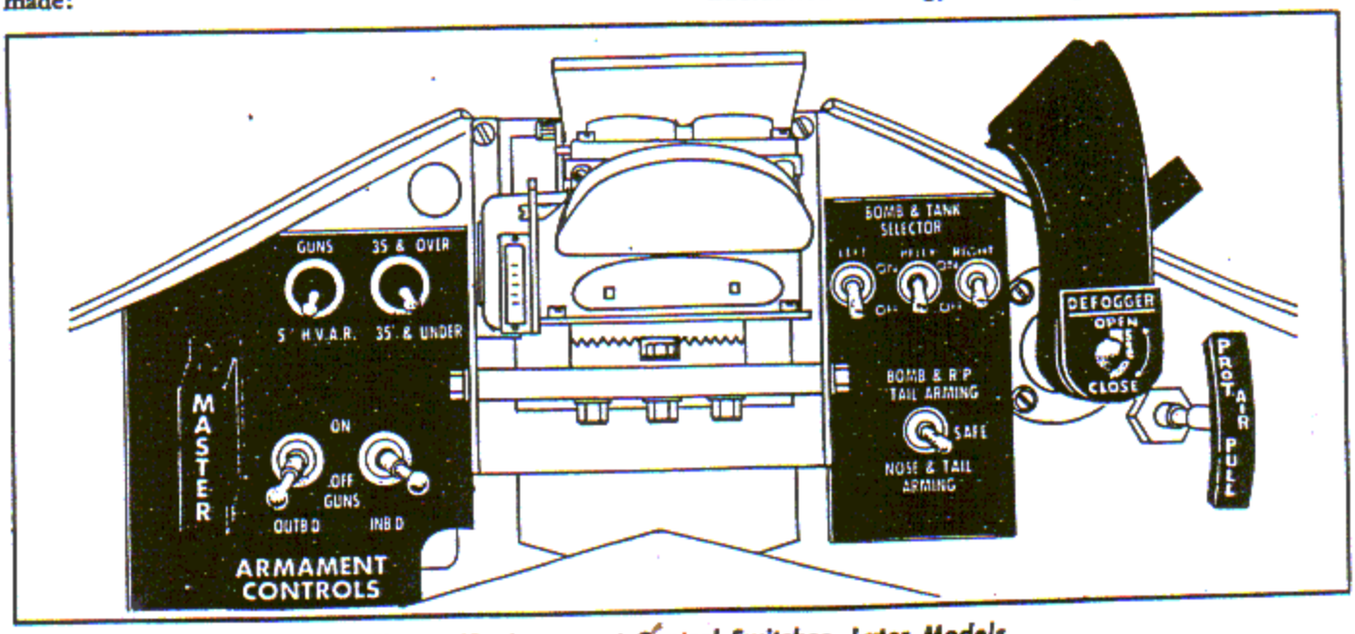


Figure 49—Armament Control Switches—Later Models

(e) SELECTOR SWITCH BOX.—A MK 20 Mod 0 selector switch box is mounted on the left hand cockpit shelf. It consists of a four position switch and a rheostat. The four position selector switch is connected to the power supply and a circuit breaker in the main distribution panel. The power supply is independent of the armament master switch and therefore should be turned "OFF" at the same time as the guns. The rheostat varies the brightness of the reticle image.

(f) RANGE CONTROL.—A range control is installed in the throttle grip. By rotating the throttle handle clockwise the maximum range in hundreds of feet is indicated at the sight unit.

Note

A 500 ohm rheostat and toggle switch may be mounted on the left console to permit temporary operation.

(2) SYSTEM CHECK.

CAUTION

Before changing selector positions be sure that the dimmer rheostat is in either the "FULL DIM" or "FULL BRIGHT" position; otherwise a power surge may burn out the dimmer rheostat. (Refer to para *(e)* above.)

(a) Battery switch "ON". This system is independent of the armament master switch.

(b) Rotate SELECTOR switch on left hand console to "GYRO". The gyro motor should start to run and the gyro reticle image should appear on the reflector plate of the sight unit. The image should stabilize quickly and be clearly defined.

(c) Turn the SELECTOR knob to "FIXED" position. The reticle image should be clearly defined and the gyro motor should not run.

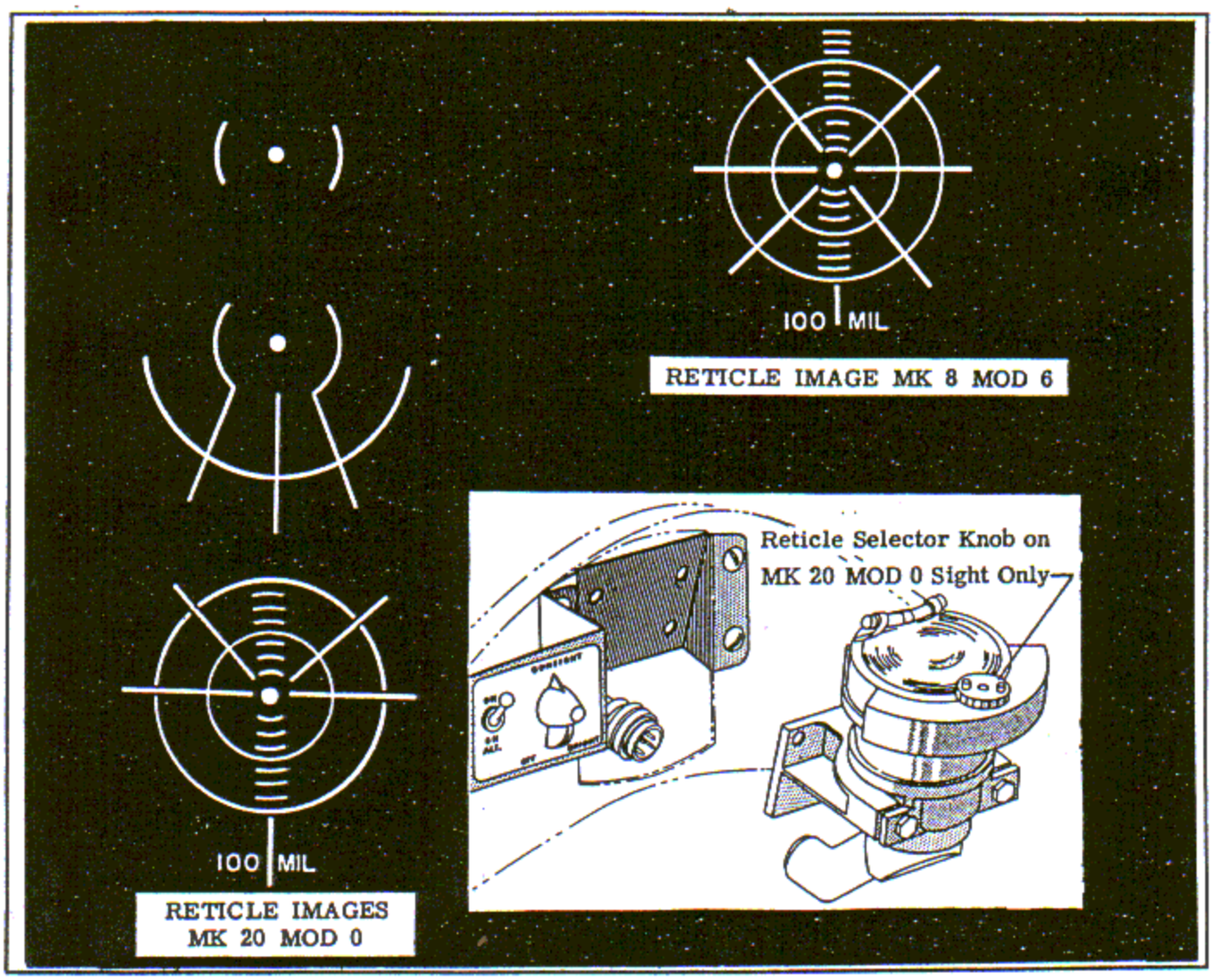


Figure 50—MK 8 Mod 6 and MK 20 Mod 0 Gunsight and Reticle Images

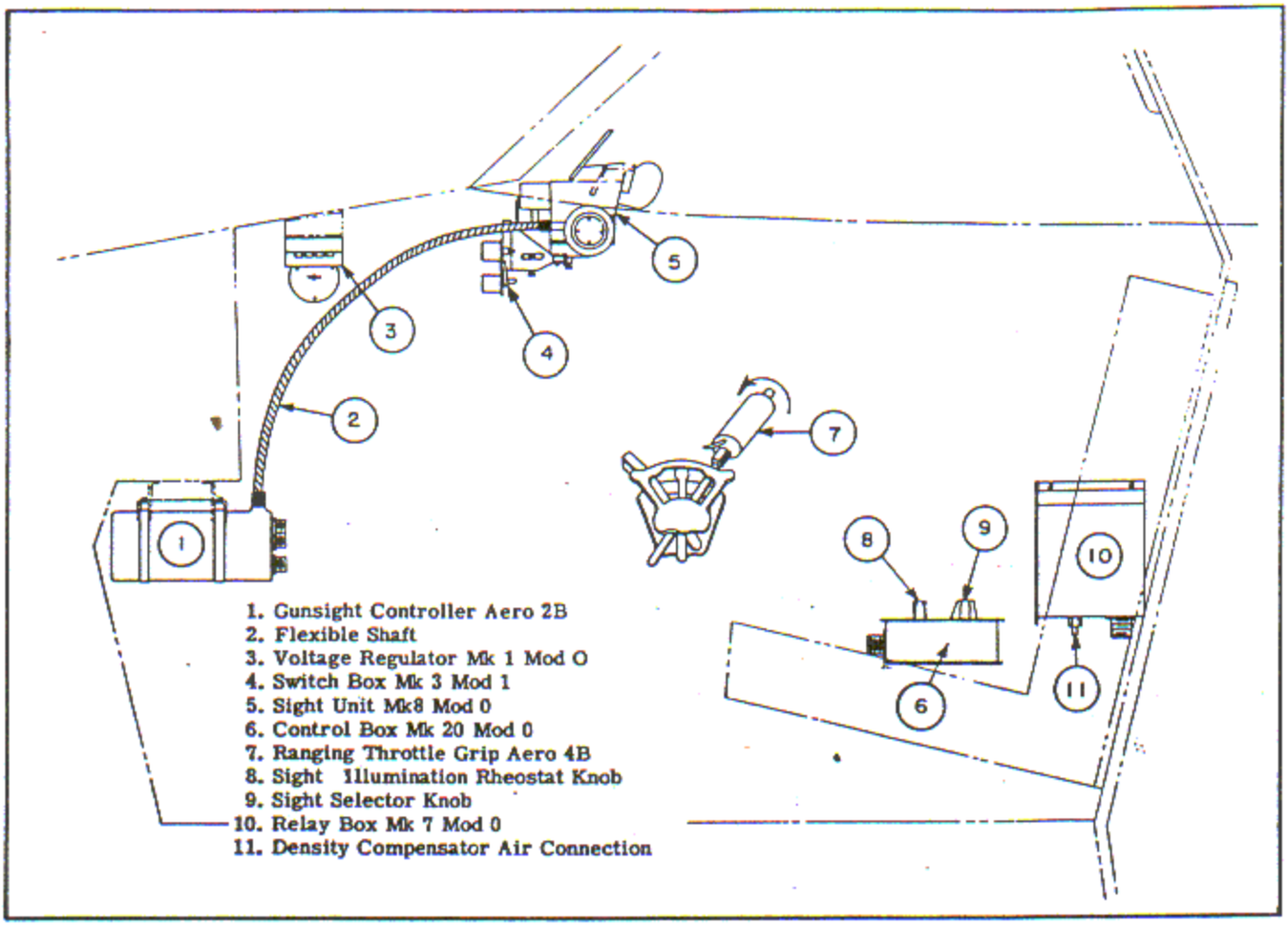


Figure 51—MK 6 Mod 0 AFCS Units Location

(d) Turn the SELECTOR knob to the "FIXED and GYRO" position. The gyro motor should start and both reticle images should be clearly defined.

(e) Turn the SELECTOR knob to the "GYRO" position. The fixed reticle image should disappear, and there should be no shift in the position of the gyro reticle image.

(f) Rotate DIMMER control knob from "DIM" to "BRIGHT" noting that the dimmer control varies the intensity of the images continuously over the entire range.

(g) With the SELECTOR in the "FIXED and GYRO" position, sight on an object at a distance of 500 feet. The reticle images should both appear clearly defined and superimposed on the object without parallax; examine one image at a time, moving the eye from side to side over the width of the reflector plate. There should be no apparent shift of the reticle image with respect to the target as the eye is moved. If the images shift more than five mils in any direction, the lens is out of focus and the sighting head should be adjusted or replaced.

(h) Set the span setting handle to the 100 foot mark and the range unit to a reading of 1000 feet. The inner points of the circle of diamond shaped dots should approximately coincide with the fifty mil radius arc of the fixed reticle.

(i) Note diameter of the circle formed by the diamond shaped pips of the gyro image, then rotate throttle grip full clockwise. The range scale in the sight unit should now indicate 2400 feet, and the diameter of the circle should be smaller.

(j) Set the SELECTOR knob to "FIXED" position and the ARMAMENT SWITCH to "HVAR" (rockets). Observe the position of the reticle image. Change the position of the DIVE ANGLE switch and note that the image moves either up or down; however, it should not move sideways more than 5 mils.

(k) Turn all switches "OFF".

(3) OPERATION.

(a) Set the relay switches in accordance with the operation attack plan, that is "GUNS" or "HVAR" and "DIVE ANGLES".

(b) Turn SELECTOR switch to "FIXED and GYRO" if desired to see both image patterns; however if they are confusing, setting the SELECTOR to "GYRO" will eliminate the fixed image, or the outer markings of the fixed image can be blanked out by pushing the masking lever forward.

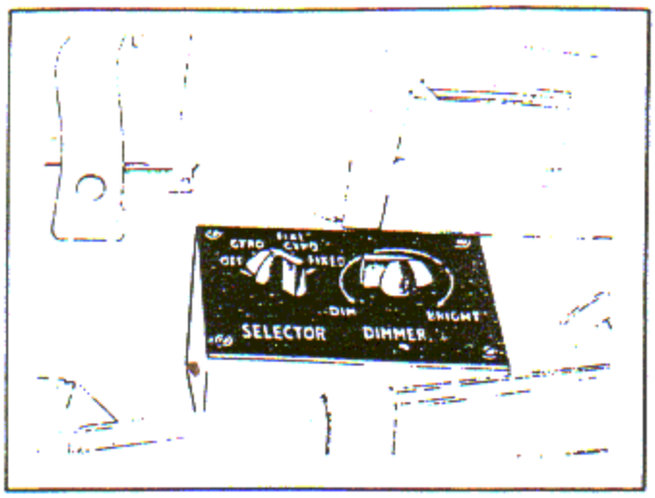


Figure 52—Sight Unit Selector Switch Box

(c) Adjust the DIMMER control knob until the reticle image is at the desired brilliance.

(d) As soon as the target is sighted, set the target span into the sight unit with the span setting handle. This setting will be a selected dimension of the target aircraft, usually its wing span in feet.

(e) Commence tracking by maneuvering the aircraft to bring the center pip of the image onto the target.

Note

The gyro will remain caged as long as the ranging control knob is at the maximum range position (fully clockwise). If tracking is to be started before the target is within range, uncage the gyro by rotating the control slightly counterclockwise.

(f) Solve for range by rotating the ranging control knob on the throttle to keep the imaginary circle, formed by the inner points of the diamond-shaped pips, just touching the extreme tips of the target.

Note

Several minutes of operation are required before the gyro motors warm up. Therefore the SELECTOR should be placed in the "GYRO" position several minutes before use.

CAUTION

Upon leaving the airplane, be sure the SELECTOR is turned "OFF" as the system is independent of all MASTER switches.

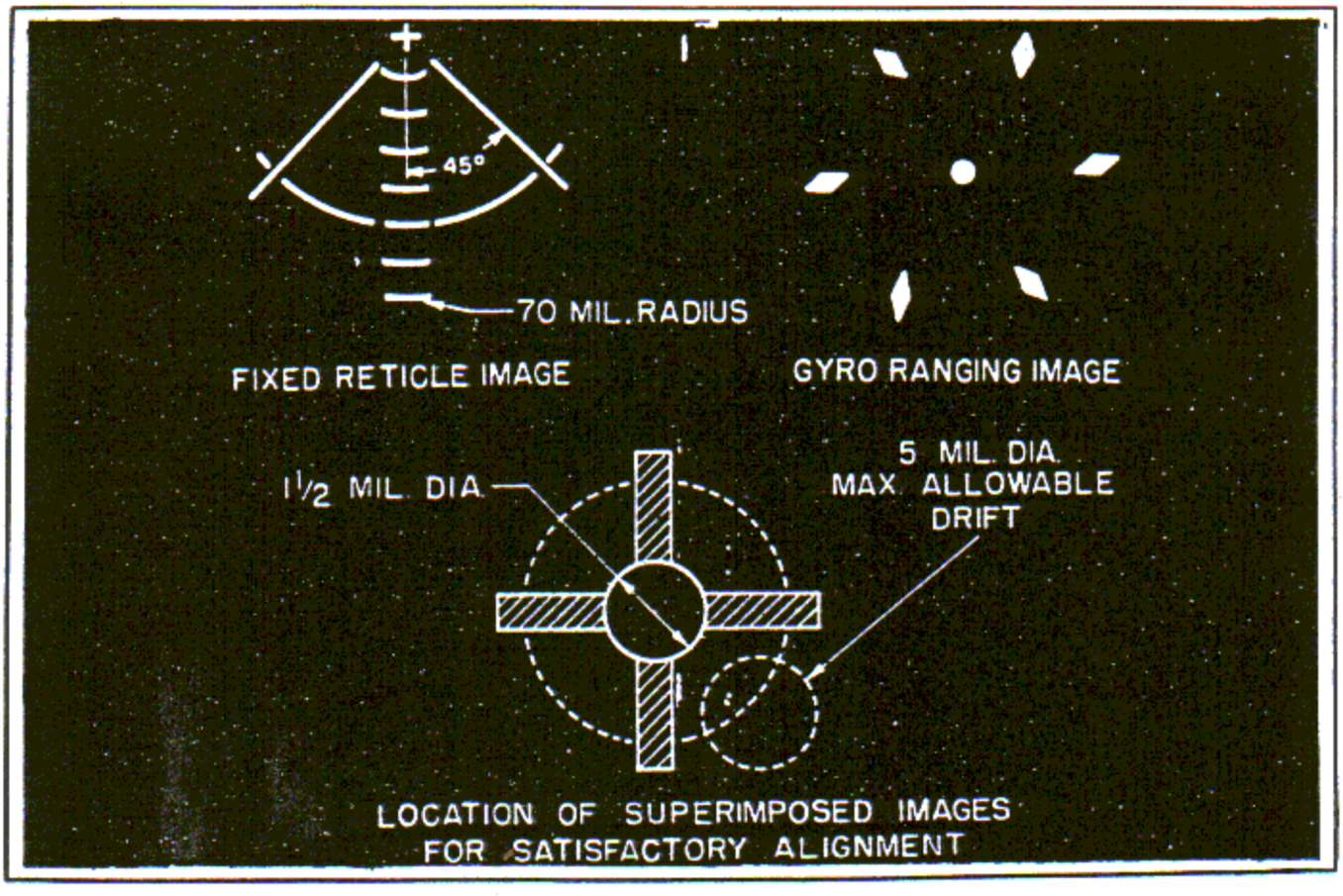


Figure 53—MK 8 Mod 0 Sight Unit Images

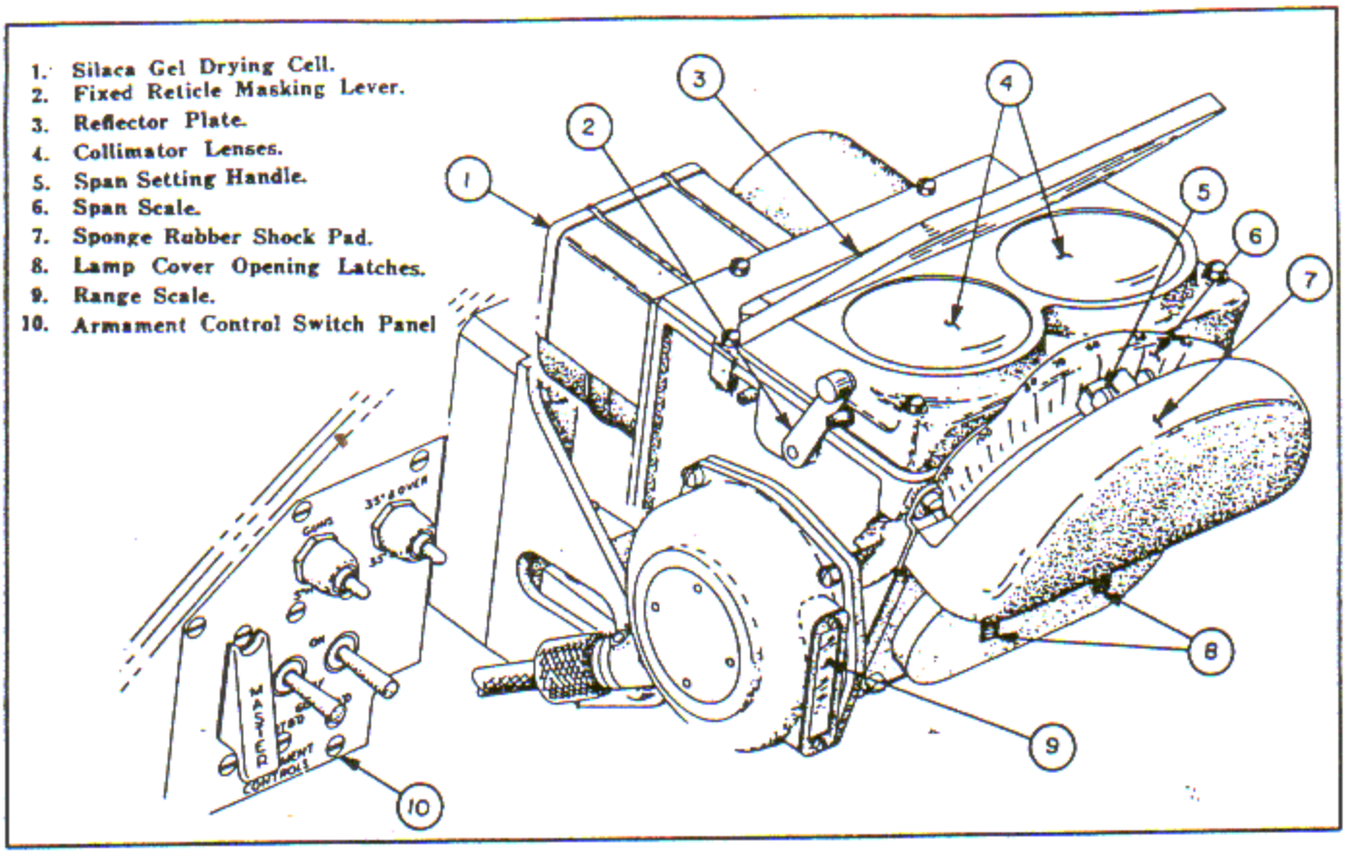


Figure 54—MK 8 Mod 0 Sight Unit

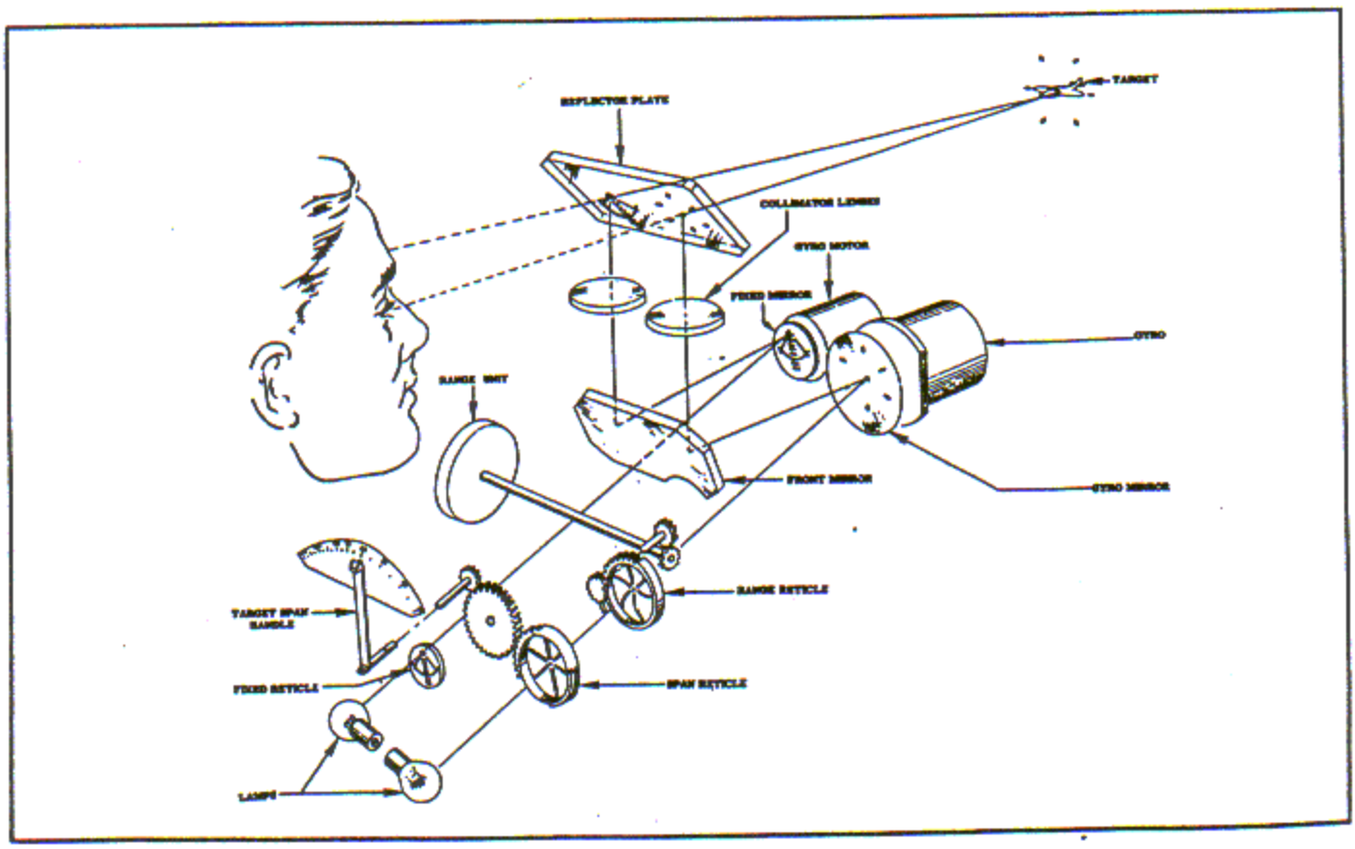


Figure 55—Sighting Unit Schematic Diagram

2. OXYGEN.

a. CYLINDER AND CONTROL.—A standard 514 cu in. capacity shatterproof oxygen cylinder is installed in the fuselage aft of the cockpit on the right hand side. The shut-off valve handwheel, connected to the cylinder, is mounted on the pilot's right side.

(1) An automatic supply system is installed in later model airplanes, therefore no manual shut-off valve is required.

b. REGULATOR.—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 diluter valve set to the "ON" (normal oxygen) position, air is drawn into the breathing system and is automatically mixed with oxygen from the supply cylinder to give the total needed oxygen required up to approximately 30000 ft, beyond which 100% oxygen is delivered. With the diluter valve set to "OFF" (100% oxygen) position, 100% oxygen is delivered at all altitudes. With the air-valve set to the "ON" (normal oxygen) position, a relatively small inhalation suction (one inch of water suction) is sufficient to deliver a flow of 150 liters of oxygen per minute. This characteristic assures the user an adequate oxygen flow and ease of breathing.

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

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

(1) Emergency valve—"CLOSED".

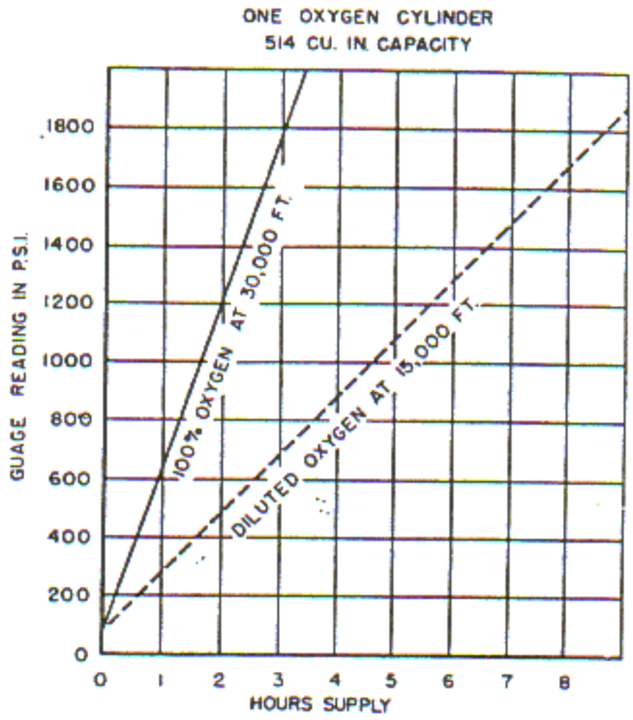


Figure 56—Oxygen Consumption Chart

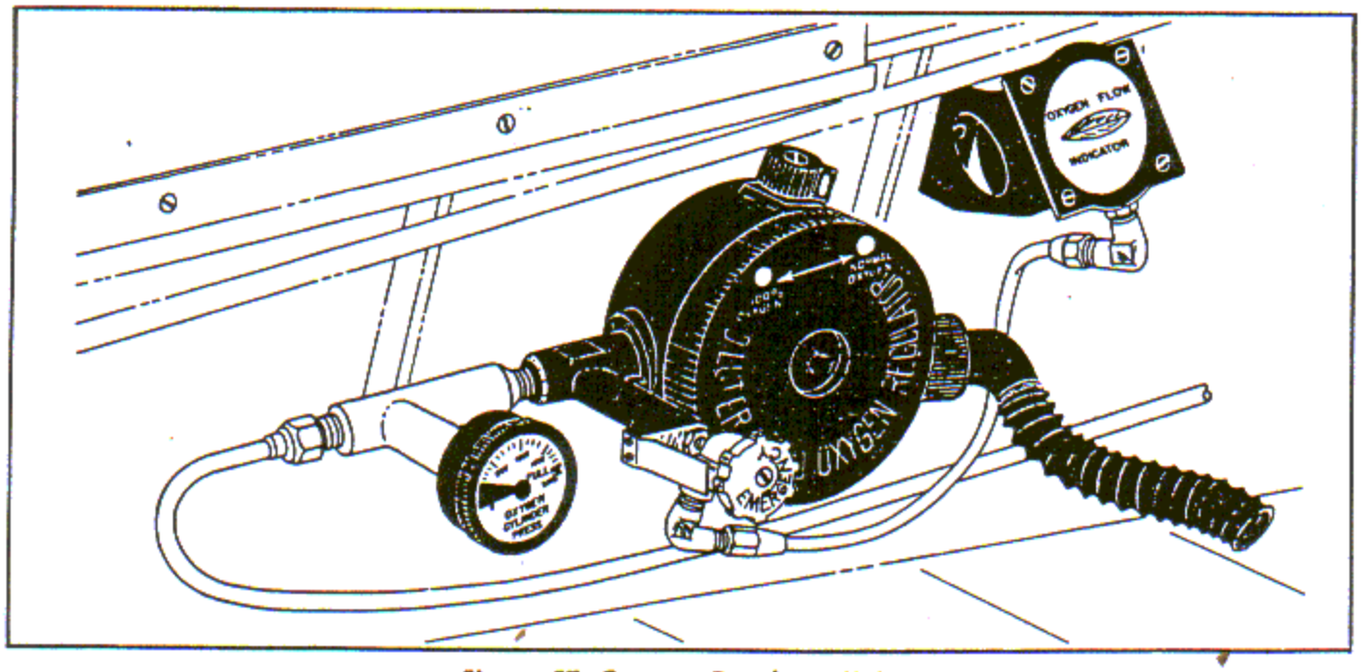


Figure 57—Oxygen Regulator Units

(2) Open cylinder valve, allow at least ten seconds for pressure in line to equalize. Pressure gage should read 1800±50 psi 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 psi in five minutes there is excessive leakage, and the 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 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 the airplane is on the ground. In this case turn diluter valve to "OFF" (100% oxygen) and test again. If oxygen flow indicator operation is now satisfactory, reset diluter valve to "ON" (normal oxygen) in which setting adequate oxygen flow and "blinker" operation will be assured.

(7) Check emergency valve by turning counterclockwise slowly until oxygen flows vigorously into mask; then close emergency valve.

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

(9) After the service change modifying the oxygen system to the automatic system is incorporated the following leak test shall be conducted in lieu of (2) and (3) above.

Oxygen supply cylinder pressure should read 1800 to 1850 psi if cylinder is fully charged. If the cylinder pressure has decreased by more than 50 pounds in 24 hours the leakage is excessive and the system should be subjected to a "Ground Crew Test" prior to use.

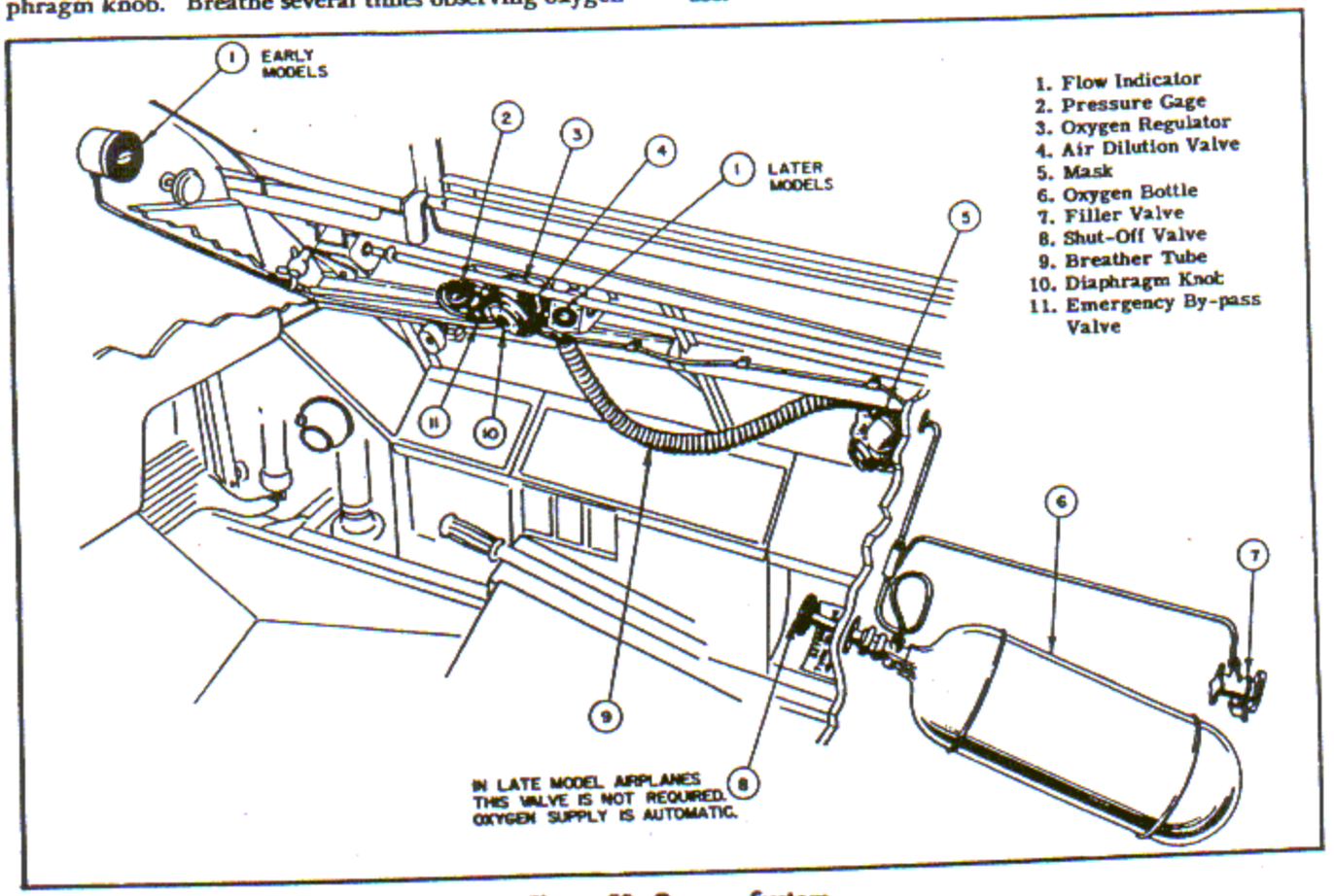


Figure 58—Oxygen System

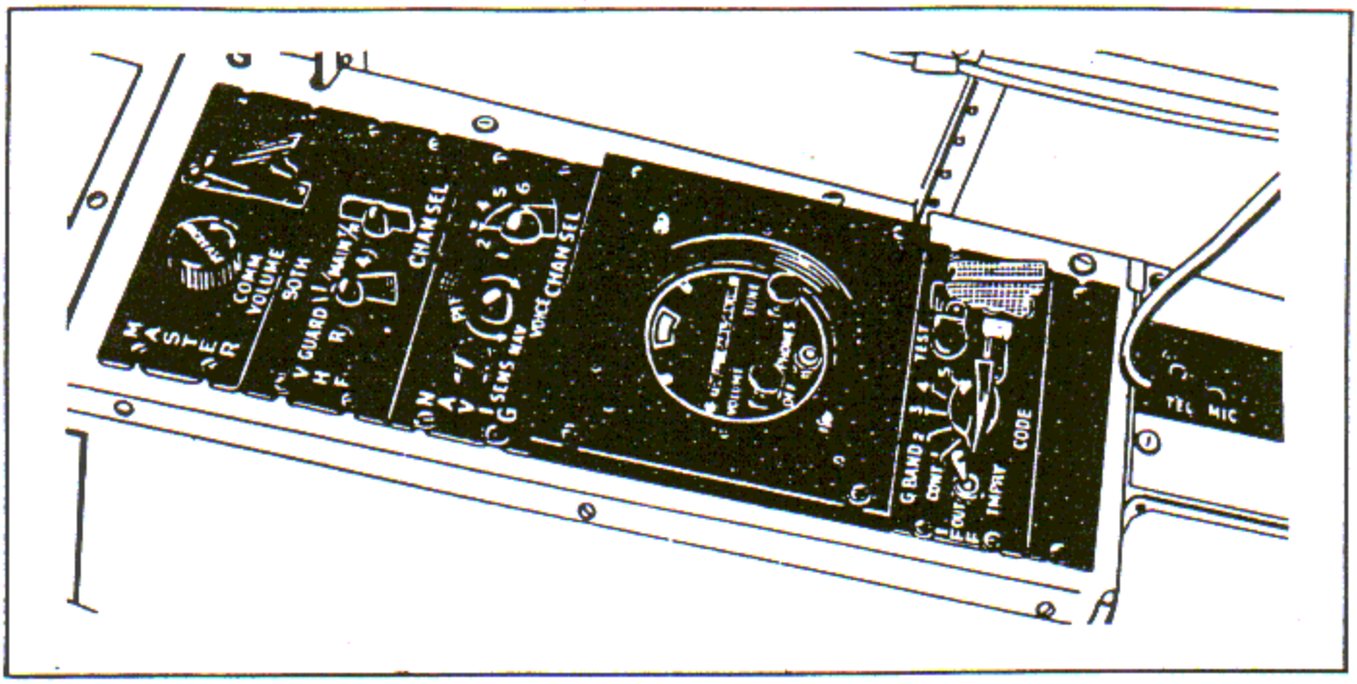


Figure 59—Communications Controls—F8F-1 and -1B

d. OPERATING INSTRUCTIONS.

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

(2) Set diluter valve to "ON" (normal oxygen) position—except when the presence of excessive carbon-monoxide is suspected—then set to "OFF" (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 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 by rotating handle "CLOCKWISE".

Note

Attach the oxygen breathing tube clamp to the right shoulder harness only, in order to hold the emergency egress restrictions to a minimum.

CAUTION

Keep oxygen equipment free from oil, grease and easily oxidized materials. Mask will deteriorate if allowed to lie in the sun for extended periods.

3. . COMMUNICATION EQUIPMENT.

a. COMMUNICATING RADIO (AN/ARC-1).—A type RT-18/ARC-1 receiver-transmitter (VHF) is mounted in the fuselage. The following control units and accessory equipment are installed in the cockpit.

(1) RADIO MASTER PANEL.—Type C-127A/ARC is installed in the foremost part of the right hand radio console. It consists of a radio master toggle switch, which applies power to all communication equipment, and a communication volume control which adjusts the VHF audio level.

(2) VHF CONSOLE CONTROL UNIT.—A type C-115/ARC-1 console control unit is installed on the right hand side of the cockpit.

(3) MICROPHONE "PRESS - TO - TALK" SWITCH BUTTON.—Installed on throttle handle.

(4) A head phone and microphone extension cord No. CX-922/AR is installed on the armor plate above the right shoulder. In airplanes prior to serial No. 9510), a J-16/ARC-5 jack box plus a hand held microphone is installed.

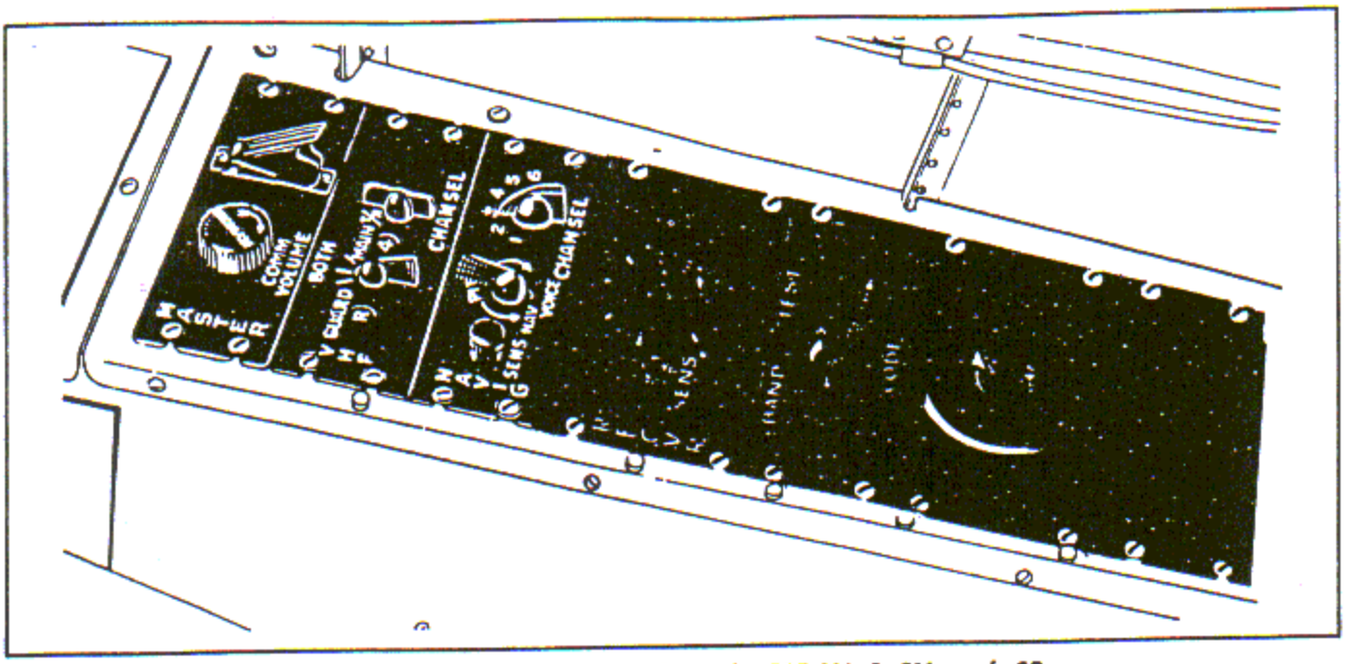


Figure 60—Communications Controls—F8F-1N,-2,-2N and -2P

b. NAVIGATION RECEIVER (AN/ARR-2A).—A type R-4A/ARR-2 receiver is mounted in the fuselage. This unit is controlled by a type C-116/ARR-2A console control unit installed on the right hand side of the cockpit.

c. RADIO RANGE RECEIVER.—An R-23/ARC-5 Range Receiver is installed in the right hand console. It is labeled "NAVIGATION". Airplanes prior to serial No. 95103 have a Setchell-Carlson Type BC-1206CM installed; however, a service change to replace these with an R-23/ARC-5 has been issued.

d. OPERATION.—With the battery switch in the "ON" position, the engine running and the generator charging, turn "ON" the radio master switch located on the "MASTER" control unit. This supplies power to all radio equipment, but not to the IFF equipment. Rotate the COMM VOLUME on the "MASTER" control unit to maximum. Plug the headset and boom microphone or mask microphone into the CX-922/AR.

(1) OPERATION OF VHF RECEIVER-TRANSMITTER.

Note

These instructions are subject to local restrictions regarding radio silence. For an actual operating test, it is necessary that signals be present on the channels on which operation is contemplated. In the absence of signals, the squelch circuit reduces the receiver output to zero so that it is impractical to properly gauge receiver performance.

(a) TO TRANSMIT AND RECEIVE ON MAIN CHANNELS.

1. Rotate "GUARD-BOTH-MAIN T/R" switch on VHF control unit to "MAIN T/R".

2. Rotate "CHAN SEL" switch on VHF control unit to desired channel.

3. Press throttle switch to talk—release to receive. Volume is regulated by rotating "COMM VOLUME" control on "MASTER" control unit.

(b) TO TRANSMIT AND RECEIVE ON GUARD CHANNEL.

1. Rotate "GUARD-BOTH-MAIN T/R" switch on VHF control unit to "GUARD".

2. Press throttle switch to talk—release to receive. Volume is regulated by rotating "COMM VOLUME" control on "MASTER" control unit.

(c) TO TRANSMIT AND RECEIVE ON MAIN CHANNELS AND RECEIVE ON GUARD CHANNEL.

1. Rotate "GUARD-BOTH-MAIN T/R" switch on VHF control unit to "BOTH".

2. Rotate "CHAN SEL" switch to desired main channel.

3. Press throttle switch to talk—release to receive. Volume is regulated by rotating the "COMM VOLUME" on the "MASTER" control unit.

(2) OPERATION OF NAVIGATION RECEIVER.

(a) On the "NAVIG" control unit, rotate the "CHAN SEL" knob to the desired channel.

(b) Rotate "PITCH" control clockwise to mid position.

(c) Set the "SENS" control to produce a usably weak signal, or if desired signal cannot be heard, to a fairly strong background hiss. (Temporarily, turn "COMM VOLUME" control on "MASTER" control unit counterclockwise to minimum.)

(d) When the signal is received, adjust the "PITCH" control to produce a pleasing audible tone.

(e) Readjust the "SENS" control to obtain a usably weak signal. The secret of accurately interpreting navigation signals lies in using the lowest satisfactory setting of the "SENS" control. Keep this control adjusted to receive only one character predominantly.

(3) TO RECEIVE RANGE SIGNALS R-23/ARC-5.

(a) Advance the "SENSITIVITY" control until normal background is heard.

(b) Tune in the desired frequency and readjust the "SENSITIVITY" control for normal operation.

(c) Rotate the "SENSITIVITY" control counterclockwise to a minimum, completing operation.

Note

Simultaneous operation of receivers may be monitored by advancing the associated volume or sensitivity control.

(4) TO RECEIVE RANGE SIGNALS (BC-1206CM.)

(a) On the top of the "RANGE" receiver, rotate VOLUME control full clockwise, thereby applying power to the equipment. Wait 30 seconds for tubes to heat.

(b) Rotate "TUNE" knob to desired station.

(c) Adjust "VOLUME" control on range receiver to desired level.

e. RADIO CHECK-OFF LIST.

(1) BEFORE TAKE-OFF.

(a) Plug in headset and microphone.
(b) Battery switch—"ON".
(c) Radio master switch—"ON".
(d) Test VHF receiver.
(e) Perform operations applicable to the mission of the airplane—test navigation receiver—test range receiver.
(f) Set controls for simultaneous reception of communication and navigation receivers.
(g) Select desired transmission channel, and if activity instructions permit, make test transmission with base station.

(2) AFTER LANDING.

(a) Radio master switch—"OFF".
(b) Range receiver BC-1206 CM—"OFF".
(c) Battery switch—"OFF".

f. OPERATING NOTES AND PRECAUTIONS.

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

(2) The radio master switch and the power switch for the Setchell-Carlson Range Receiver are connected in series. Therefore it is necessary that both switches be "ON" for the operation of the Setchell-Carlson Range Receiver.

(3) The R-23/ARC-5 receiver does not have an individual power switch. Therefore it is only necessary to have the radio master switch "ON" for the operation of this unit.

(4) The "COMM VOLUME" control on the MASTER panel controls the volume of the AN/ARC-1 VHF receiver only. The other receivers have their own individual "SENS" or volume controls.

g. IFF EQUIPMENT (AN/APX-1).—A type RT-22/APX-1 receiver-transmitter unit, and a type SA-3/A impact switch are mounted in the fuselage. The AN-M1 destructors may be installed in the receiver-transmitter unit. A type C-119/APX control unit is installed in the console mount in the right hand side of the cockpit.

(1) OPERATION OF IFF EQUIPMENT.

(a) TO TURN ON.—Check switch labeled "G BAND". It should be in the "OUT" (vertical) position. Rotate control labeled "CODE" to position "1". Leave CODE control in position "1" at all times when operating the equipment unless otherwise directed.

(b) TO SHOW DISTRESS. — Rotate CODE control to full clockwise position lifting safety latch labeled "PUSH" so that control may be advanced and set on "EMERGENCY" position.

(c) TO OPERATE G BAND.—Move switch handle to position marked "CONT" (forward) when continuous "G BAND" operation is required. When switch is held in "TMPRY" position momentarily and then released, "G BAND" operation will continue for about 15 seconds.

(d) TO SECURE.—Return all control to "OFF" position.

(e) TO DESTROY RECEIVER TRANSMITTER.—Raise red guard labeled "DESTRUCT" breaking safety wire and move switch handle to position "ON" (forward).

h. RADIO ALTIMETER EQUIPMENT.—F8F-1N, -2,-2N and -2P.

(1) GENERAL.—The AN/APN-1 radio altimeter equipment consists of a type RT-7/APN-1 transmitter-receiver which is mounted in the top of the fuselage aft of the cockpit; a type SA-1A/ARN-1 altitude limit switch mounted on a plate on the radio console; a type I-D14B/APN-1 altitude indicator installed on the left hand side of the instrument panel; three limit indicator lights installed on the side of the radar scope bracket; and two type AT-4/ARN-1 antenna assemblies.

The transmitting antenna is located on the left wing trailing edge; and the receiving antenna on the right hand stabilizer. The equipment is designed to provide direct measurement of altitude relative to the terrain during flight within a low range of 0 to 400 feet and a high range of 400 to 4000 feet. When operating in the high range the altitude limit switch settings are ten times those shown on the dial.

(2) OPERATION.—To operate the radio altimeter equipment, proceed as follows:

(a) Turn the power switch on the rim of the indicator to "ON".

(b) A low range flight check should be made by flying in line with an object of known height.

(c) The low and high range readings should be observed throughout the flight for general correlation of the altitude indicator with corrected barometric altimeter readings.

Note

Only the low range should be used when below 400 feet. The high range gives false indications, usually reading high below this altitude. The white and amber lights are not installed.

(d) Set the limit switch at the desired altitude. The red low limit light on the instrument panel indicates flight below the preset altitude.

Note

On night fighters, the low limit light is part of the radar indicator.

(e) At an altitude considerably above the upper limit of each range, the indicator needle will fall back from its full scale position (drop out altitude).

(f) The low range reading, while landing, should read approximately zero.

i. RADAR EQUIPMENT.

(1) GENERAL.—F8F-1N and F8F-2N airplanes are equipped with AN/APS-19 radar consisting of three units:

(a) Indicator and vinylite hood located at the base of the windshield.

(b) Pilot's control panel located below and to the left of the seat.

(c) Nacelle located on the right wing bomb rack.

Note

The night fighters are delivered with the right wing bomb rack inoperative to prevent inadvertant release of the radar nacelle. A special locking pin is installed in the bomb rack of the F8F-2N.

(2) OPERATION.—Preliminary control settings before attempting to turn the equipment on are as follows:

(a) CONTROL UNIT (C-282/APS-19).

GAIN—"AUTO".
SCAN ANGLE—"130°".
RANGE—as desired.
FUNCTION—as desired.
TUNE—"AUTO".
SEA SUPRESS—"OFF".

(b) TURNING ON THE EQUIPMENT.

1. Turn the "FUNCTION" selector switch on the control unit to the desired position.

(c) SELECTION OF OPERATING SEARCH RANGE.

1. With the equipment in normal operation and the "FUNCTION" selector switch in "SEARCH" position, select the desired range by the "RANGE" control.

2. Adjust "TILT" to suit altitude and attitude of aircraft.

(d) SELECTION OF OPERATING BEACON.

1. With the equipment in normal operation, flip the "FUNCTION" selector switch to "BEACON".

2. Rotate the "RANGE" control to the desired range and look for beacon indications on the scope.

(e) USE OF TUNING KNOB.

1. If no indications appear on the scope, rotate the TUNING KNOB from its "AUTOMATIC" position very slowly throughout the "MANUAL" range. Select the position which gives the best indications.

(f) GUN—AIM.

1. When the target is within 0.5 nautical miles, flip the "RANGE" selector switch to "AIM" position. At firing range the target indication will extend the full distance across the face of the indicator.

(g) RECEIVER GAIN CONTROL.

1. Set the GAIN control on "AUTO".

Note

At short ranges from surface and beacon targets, use of the manual control will allow finer azimuth bearing readings. In manual operation, gain is low if signals disappear, high if "snow" tends to blot out signals.

b. STANDBY OPERATION.

1. When sea reflection is so great as to interfere with signals, it may be reduced by clockwise rotation of the SEA SUPRESS control on the auxiliary control unit. This control must be used judiciously in order not to cover surface targets.

(i) TO TURN THE EQUIPMENT OFF.

1. Turn "FUNCTION" SELECTOR switch to "OFF" position.

2. If the TUNING control has been adjusted within the "MANUAL" range, return it to "AUTOMATIC".

Note

The TILT control is used only when operation is "SEARCH" or "BEACON". The "AIM" control functions only when using "INTERCEPT".

4. **PHOTOGRAPHIC AIRPLANE.**

a. GENERAL.—The F8F-2P is a photographic reconnaissance model intended for use as a land or carrier based long range unit. Due to the large number of camera installations which can be carried, it is unusually flexible with regard to the determination of the desired type of photograph.

(1) The equipment will permit the accomplishment of aerial photographic reconnaissance with any one of the following camera installations:

K17-6" Vertical
K17-12" Vertical
K17-24" Vertical
K17-24" Oblique—Set 3 degrees
K17-24" Oblique—Set 15 degrees
K18-24" Vertical

b. PHOTOGRAPHIC EQUIPMENT. — The photographic equipment is installed in the fuselage aft of the pilot's rear bulkhead and is operated from the cockpit. The fuselage contains the camera mount, camera mount supports, sway braces, vacuum system, oblique sliding door (port side only), vertical sliding door and door actuating cables.

c. CAMERA CONTROL PANEL. — The camera electrical control panel assembly, located on the left hand side of the cockpit adjacent to the intervalometer, contains the master camera switch, manual and automatic switches; and the warning lights for the intervalometer, film feed and the camera doors. The film feed warning light and the camera door light are green and the intervalometer light is red.

(1) The manual picture control switch, for taking selective pictures, is located on the control panel. The manual switch operation permits the pilot to take individual pictures. The push button must be depressed for each picture desired.

d. INTERVALOMETER.

(1) DESCRIPTION.—The controls for the B-3B type intervalometer consist of the power supply toggle switch, setting knob, recycle knob, and an extra-picture switch. A dial on top of the intervalometer is graduated in seconds for the direct indication of the time interval between film exposures. A setting hand indicates the selected time interval on the dial and is controlled by the setting knob. An interval hand indicates the number of seconds of the interval remaining before the camera will be tripped. The setting knob provides the means of setting the desired time interval. To accomplish this, depress and turn the knob until the hand indicates the proper reading on the dial. When the setting hand is released, it is locked by a pinion indent.

(a) The recycle knob provides a means of tripping the camera before completion of the preset interval. After the camera has been tripped by this method, the complete interval cycle is started again.

(b) The extra picture switch button is located immediately below the dial and may be used at any time to take pictures, whether the power supply toggle switch is "ON" or "OFF". If the camera is operating at regular intervals through the intervalometer (power switch "ON"), the manual taking of extra pictures by the push button does not affect the schedule except to add the extra exposure; the regular exposures will continue to be made at the set interval. The intervalometer places the camera under automatic time-interval control when "ON". When the switch is "OFF", power is still available for extra-picture push-button operation.

(c) An electro-magnetic counter indicates the number of film exposures that have been made. This may be manually reset to zero by depressing and turning the reset cap.

(2) OPERATION.—The setting hand can be rotated to any position between 2 and 120 seconds on the dial by depressing and turning the setting knob marked "INTERVAL" thereby indicating the selected time interval on the dial scale. The setting hand remains where set by the knob; and the interval hand, indicating the remaining time portion of the set interval, returns to zero in one second increments. Upon reaching the zero position it automatically snaps back to its original set position and starts again to return to zero. The camera is tripped the moment this interval hand reaches zero on the dial.

(a) INTERVAL SELECTION. — The required time interval may be determined from altitude speed charts. The interval selection is dependent upon the camera to be used, altitude, airplane speed, and the percentage of overlap desired.

(b) COUNTER RESET.—The counter should be reset by depressing the reset cap and turning it "CLOCKWISE".

(c) INTERVALOMETER SETTING.—Adjust the starting hand by depressing and turning the setting knob. "CLOCKWISE" rotation decreases the interval time. "COUNTERCLOCKWISE" rotation increases the interval time.

e. PRE-FLIGHT SYSTEM CHECK.

(1) Place all the camera control panel toggle

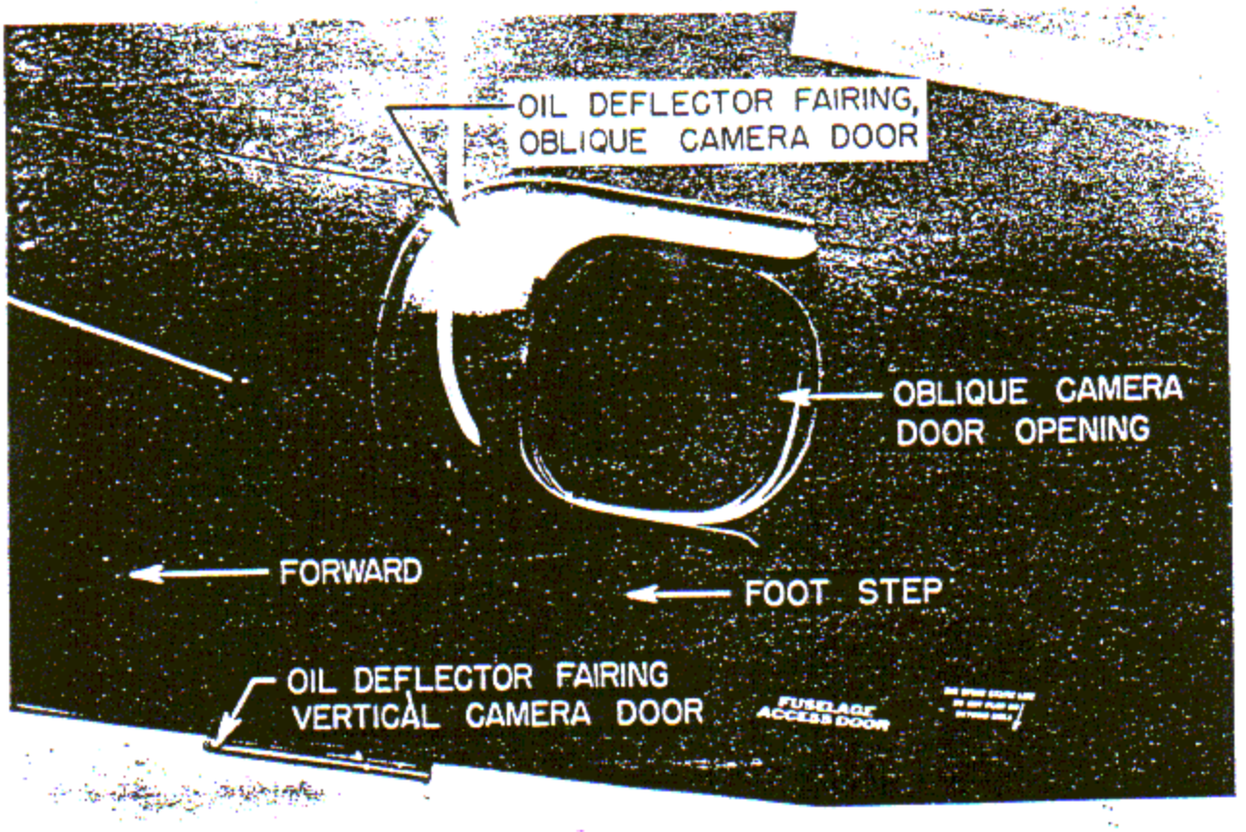


Figure 61—Camera Doors—F8F-2P

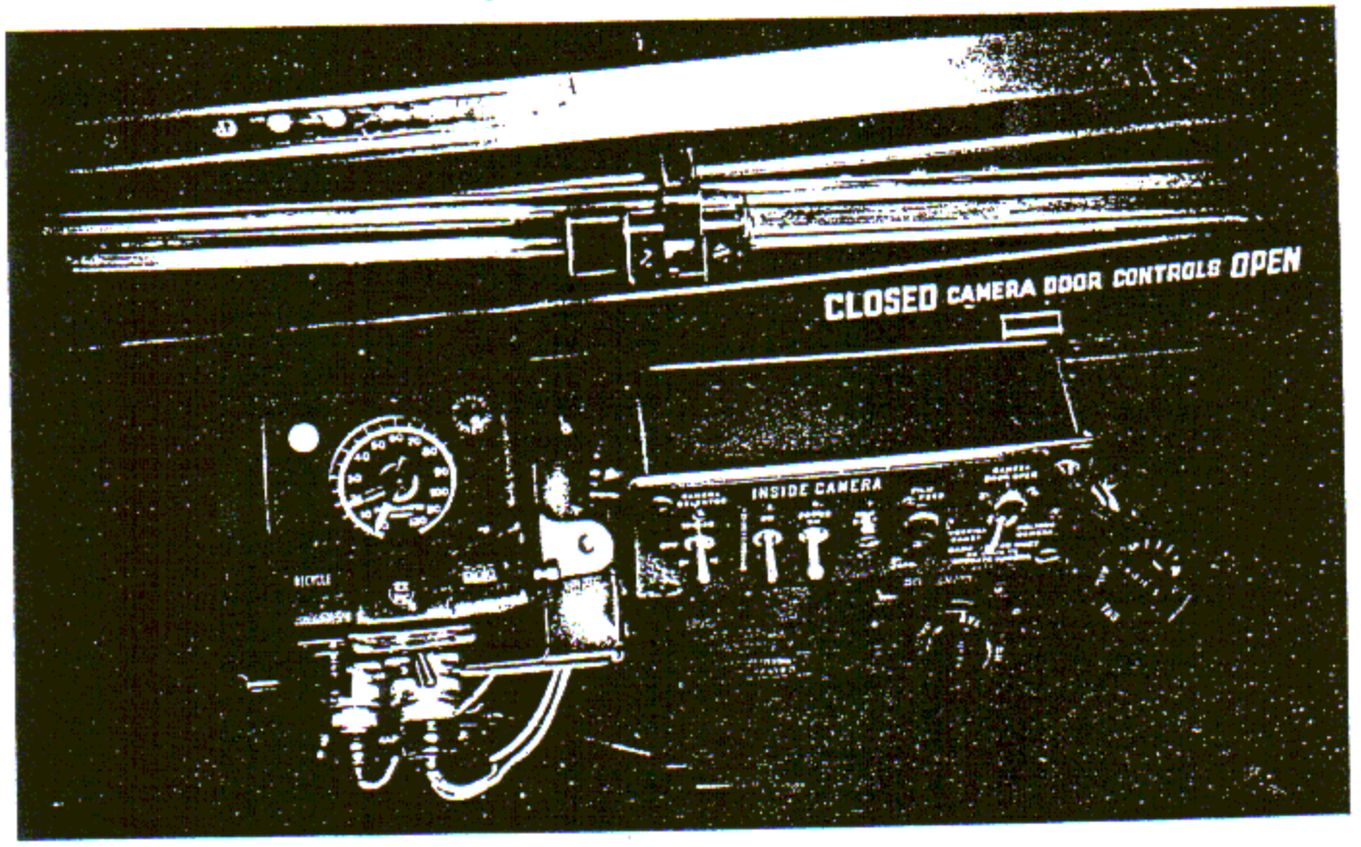


Figure 62—Cockpit Camera Controls—F8F-2P

switches and the intervalometer switch to the "OFF" position.

(2) Put battery switch to "ON".

(3) Select "INSIDE" or "OUTSIDE" camera switch as required.

(4) Select "VERTICAL" or "OBLIQUE" camera switch as required.

(5) Put "CAMERA MASTER POWER SWITCH" to "ON". Located on right hand console.

(6) Open camera doors with control handle and check "CAMERA DOOR OPEN" indicating light. Illuminates green with doors fully open.

(7) Set "POWER ON" switch to "POWER ON".

(8) Select the cycle of operation on the intervalometer and return the picture counter to "ZERO".

(9) Set intervalometer switch on intervalometer to "ON". Intervalometer switch on camera control panel should be placed in "OFF" position. After the instrument has a five minute warm-up, check with the aid of a stop watch. The intervalometer should trip the camera at the pre-determined interval set on the dial, if functioning correctly.

(10) Note operation of intervalometer warning lights. White on the intervalometer and red on the camera control panel—they will flash simultaneously two seconds before camera operation.

(11) Check extra picture and re-cycle buttons on the intervalometer by operating them several times. The re-cycle button should be depressed and held until the operation has started, then released.

(12) This completes the cockpit check-out. Turn intervalometer switch to "OFF" position.

(13) For a final check of the electrical system, two men are required; one in the cockpit and the other inside the fuselage. The man in the cockpit picks up operation (12) above and sets the intervalometer switch to the "ON" position, and also sets the camera control panel intervalometer switch to "ON". The man in the fuselage should check to be sure that the camera functions at the interval selected on the intervalometer.

(14) After completion of the above check, return all switches on both the camera control panel and intervalometer, and on the right hand console to the "OFF" position.

f. PROCEDURE AT TAKE-OFF.—Set the intervalometer counter at zero. The counter, located on the side of the case, should be reset by depressing the reset cap and turning "CLOCKWISE". Be certain that intervalometer switch is "OFF".

g. PROCEDURE AT TARGET AREA. — Upon reaching the area to be photographed, proceed as follows:

(1) Set the setting hand on the intervalometer by depressing and turning the setting knob. Clockwise rotation decreases the interval at which the photographs are taken; counter-clockwise rotation increases the interval. The interval hand, indicating the remaining time portion of set interval, returns to zero at one second increments. Upon reaching zero, it automatically returns to the original set position and starts again to zero. Intervalometer warning lights on camera control panel and the intervalometer flash two seconds before the exposure is made.

Note

The required time interval may be determined from altitude-speed charts. The interval selection is dependent upon altitude, airplane speed, focal length of the lens and the percentage of overlap desired.

(2) Select "INSIDE" or "OUTSIDE" camera switch, as required, on control panel.

(3) Select "VERTICAL" or "OBLIQUE" camera switch, as required, on control panel.

(4) Select "CAMERA MASTER POWER" switch to the "ON" position. This switch is located on the aft end of the right hand console.

(5) Select "POWER ON" switch and move to the "POWER ON" position, (control panel).

(6) Select the intervalometer switch, on the intervalometer, to the "ON" position. The intervalometer switch on the camera control box should be placed in the "OFF" position, until actual operation is required.

(7) When the camera system is functioning, note the operation of the intervalometer warning light (white), and the camera control panel intervalometer light (red), both will flash two seconds before the camera operation. These warning lights will illuminate simultaneously.

h. PROCEDURE AT COMPLETION OF PHOTOGRAPHY.—After completion of photography, return all switches on the camera control panel, intervalometer, and master camera power switch, (aft end of the right hand console), to the "OFF" positions.

SECTION VI
EXTREME WEATHER

1. COLD WEATHER.

a. BEFORE ENTERING THE COCKPIT.

(1) A CO_2 fire extinguisher should be readily available.

(2) Remove by sweeping or with a hot compressed air blast, all ice or snow from the airplane.

(3) Ascertain that the tires are not frozen to the ground. This may be prevented by parking on canvass or pine boughs.

(4) Determine that the contents of fuel, oil, water injection and windshield degreasing tanks are not frozen. When their drain valves are opened the contents should flow freely.

(5) Batteries should be kept fully charged and in as warm a place as possible. If left uncharged there is danger of the electrolyte freezing.

b. PREHEATING ENGINE. — If the weather is extremely cold and the starter will not turn the engine over at least 25 rpm's, hot air blast heaters should be used.

(1) Any increase of the cylinder temperature gage reading indicates sufficient external heat has been applied.

CAUTION

Temperatures above 250°F (121°C) may cause damage to rubber or fabric parts.

(2) Preheat the carburetor by directing a hot air blast into one of the wing intake ducts. Cover the other duct up; but do not forget to remove the cover when finished. Set the ignition switch "OFF", mixture in "IDLE CUT-OFF", throttle "FULL OPEN". While the hot air is being directed into the carburetor duct, pull the propeller through several times in order to suck the warm air into the cylinders and thus facilitate drying the spark plugs.

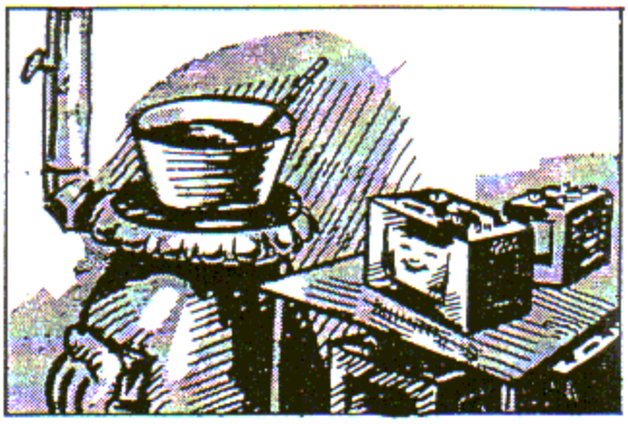


Figure 63—Keep Batteries and Oil Warm

(3) Preheat the oil with an immersion heater if available, or if the oil had been drained after the last operation, be sure it is heated to at least 70°F (21°C) before being put into the tank.

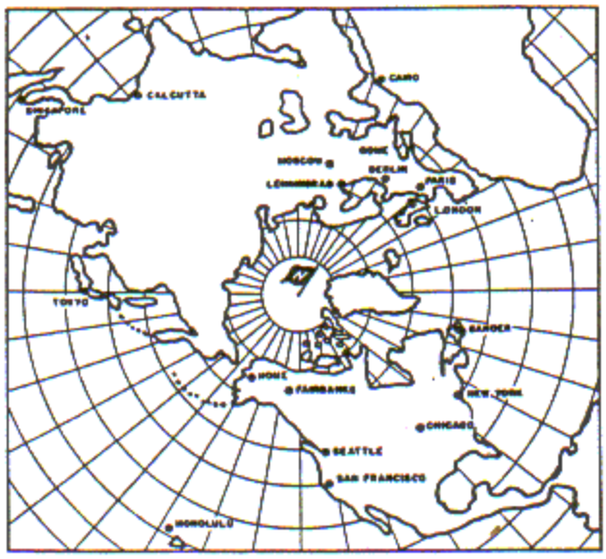
c. STARTING ENGINE. — When making cold weather starts the following procedure in addition to that listed in section III paragraph 4, should be observed.

(1) Ascertain that a minimum cranking speed of 25 rpm is obtained.

(2) Turn "ON" the ignition switch and fuel booster pump. Engage the starter with the index finger, press down cylinder prime switch with middle finger, crank engine six to ten seconds or until several cylinders fire. After cylinders fire a momentary engine surge will increase the rpm's to between 70 and 100. This momentary surge or rpm increase will enable the cylinders to pick up enough atomized fuel coming from the blower section to keep it running.

Note

On airplanes equipped with dual priming systems the pilot should press the carburetor prime switch with his ring finger the moment engine surge is noticed. Use only the carburetor prime when starting a hot engine. (Dual priming has been a service installation only.)



CAUTION

1.

On airplanes with the Automatic Engine Control installed, the throttle lever must not be advanced more than 1/3 of its travel at any time during cranking. Otherwise a large amount of uncontrollable power will result, possibly enough to nose the airplane over. The stiff oil will cause sluggish, delayed response even though the throttle is closed quickly.

2.

On airplanes equipped with the AEC unit the throttle butterfly valves should be manually closed by pulling down the control rod (to the carburetor); this prevents excessive throttle openings and is particularly important during cold weather operation.

(3) If the engine starter is pulling more than 250 amperes from the auxiliary power unit while engine is cranking the plane was not properly oil diluted the night before. The usual ampere output for starting with an auxiliary power unit is between 170 and 250 amperes.

(4) Vary the pitch of the propeller occasionally to increase oil circulation and prevent the accumulation of ice or snow.

(5) After starting, heavy viscous oil in the system is indicated by: (a) oil pressure too high (b) pressure fluctuates or drops as rpm is increased. This condition can be corrected by careful use of the oil dilution system. Use this method with caution, and only when extreme weather conditions and lack of time prevent normal engine preheating.

WARNING

Do not over dilute as serious damage may result.

d. INSTRUMENTS.—If necessary, a hot air blast may be used to apply heat to instruments which operate independently of the engine.

e. GUNS. — Be sure the gun heaters have been plugged into their receptacles. Heaters function only when the generator is charging. The gun camera should be equipped with a lens heating unit to prevent the accumulation of frost or fog. In very cold weather turn "ON" the gyro motor of the MK 8 gunsight about five minutes before its use is anticipated, otherwise inaccuracies may result.

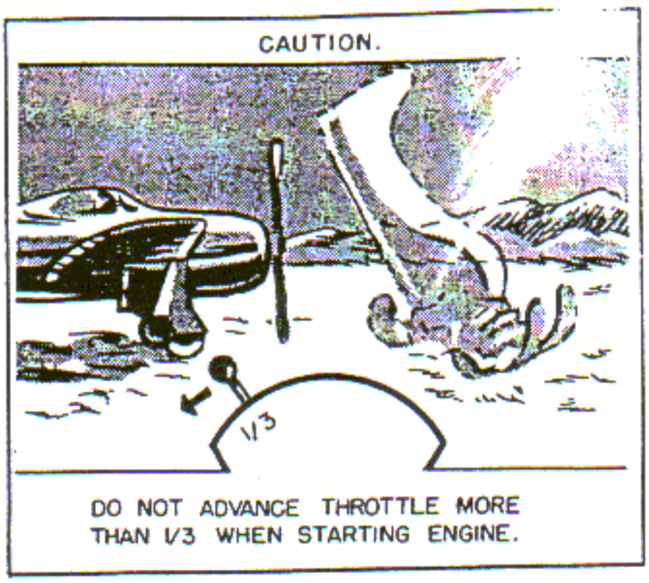


Figure 64—Throttle Position—Cold Weather Starting

f. WINDSHIELD.—If frost has formed on the inside of the windshield, warm the cockpit with blast heaters and wipe off the frost as it melts. Leave the sliding canopy slightly open to prevent further frost formation. In flight use the windshield defogging system located on the right of the instrument panel.

g. TAKE-OFF.—If the runway has not been cleaned, have the snow packed down by driving trucks or other vehicles down the runway.

WARNING

Never take off with snow, ice or frost on the wings. Even loose snow may not blow off completely. Loss of lift and treacherous stalling characteristics may ensue.

h. RADIO.—If snow is to be encountered in flight, static dissapators in the form of trailing wires may be installed at the tail and trailing edges of the wings.

i. CARBURETOR ICING.—When the air is humid, carburetor icing is likely to occur. Use protected air when icing conditions prevail. Before landing use protected air.

CAUTION

Do not use "PROTECTED AIR" while starting as back-fire damage may result.

j. LANDING GEAR AND FLAPS.—In flight, operate the landing gear and flaps occasionally to prevent freezing in the "UP" position.

k. PITOT TUBE HEATER.—It should be turned "ON" only when the generator is charging. Use it sparingly in order to conserve the battery.

CAUTION

Prolonged use of pitot heat on the ground will cause overheating and damage the heating element.

l. ELECTRICAL SUIT HEATER.—To use, plug into receptacle on right hand console. Remove plug when generator is not charging.

m. LANDING.

(1) Close the cowl flaps and shift to rich mixture. Maintain sufficient power to keep cylinder head temperature above 100°C.

WARNING

1.

Use "PROTECTED AIR" if icing conditions prevail.

2.

Lower landing gear and flaps at a safe altitude.

3.

During the landing operation, it is suggested that the propeller be left in high rpm position so that in case of emergency the maximum power for acceleration and climb will be immediately available.

(2) Land as slowly as practicable, use brakes cautiously if runway is slippery.

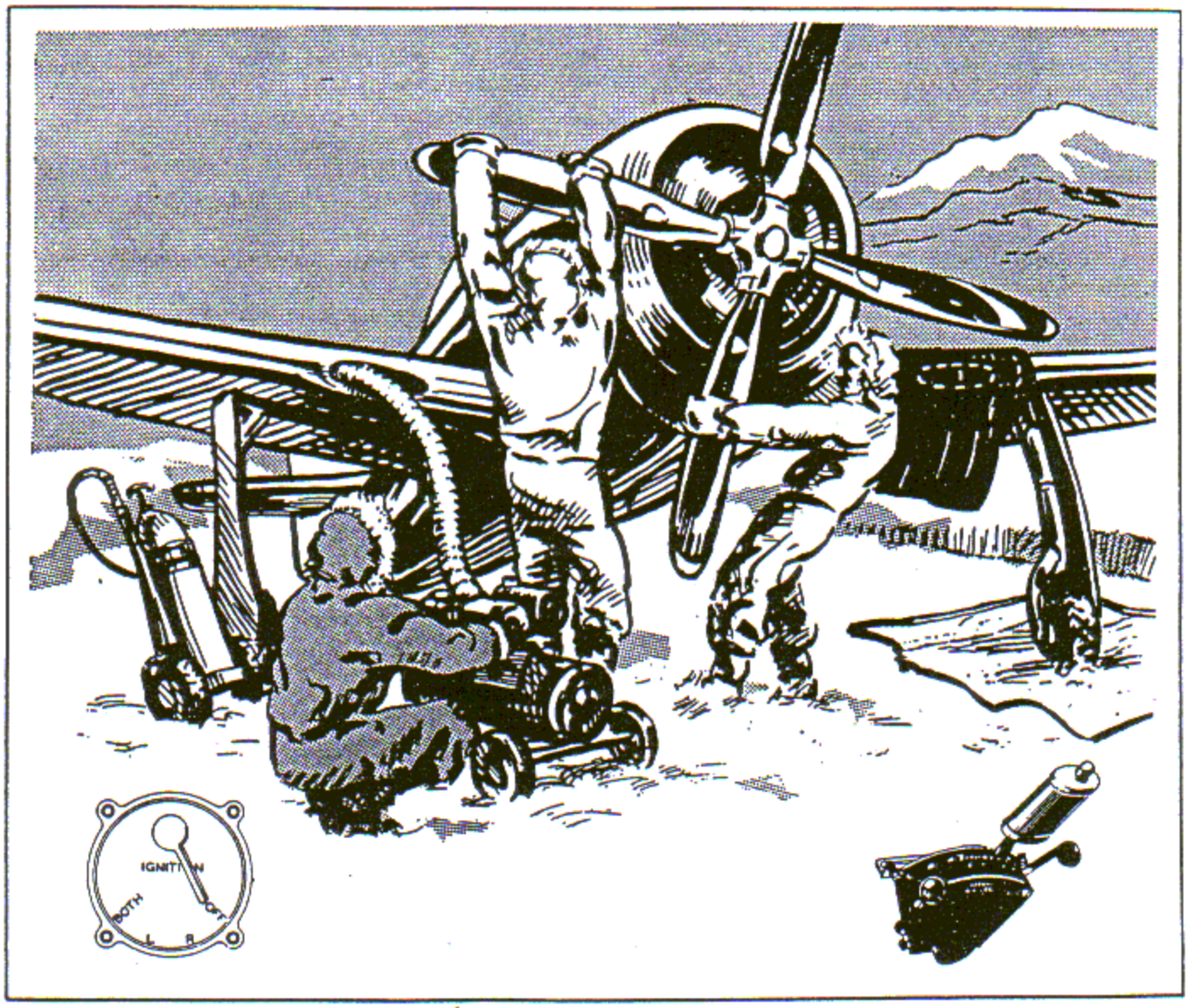
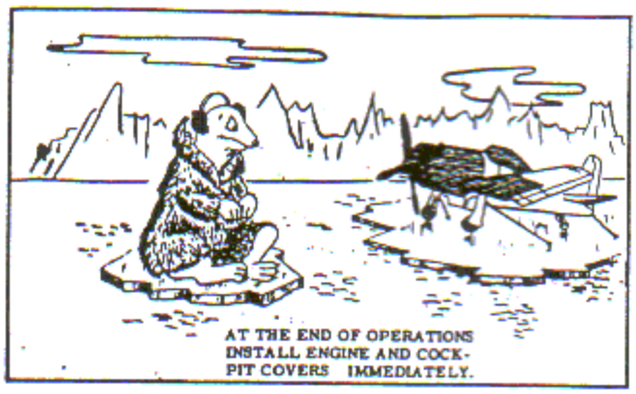


Figure 65—Pre-Heating Engine



(3) To prevent freezing of the brakes do not taxi or park in mud or water.

(4) Park the airplane in a protected area where snow and ice is least likely to accumulate. Beware of PERMAFROST ground where only the top surface is frozen hard, underneath is soft mud. Place covers and tarpaulins over wings, tail, windshield, engine and propeller. If covers are not available removal of ice may be made much easier by coating the various surfaces with de-icer oil (15 parts glycerine to 85 parts alchohol).

n. OIL DILUTION.—In order to insure even oil circulation and quick starting during cold weather, 4°C (40°F) or below, the engine oil may be diluted with gasoline. This operation is performed before stopping the engine, when cold weather is anticipated at the next start. It is imperative that the oil outlet temperature be kept as low as possible in order to keep fuel evaporation to a minimum. In order to obtain this required low oil temperature, it is often necessary to allow the engine to cool for a short time. Sufficient cooling is indicated when the cylinder head temperature has dropped to 200°C (392°F) and the Oil-In temperature has dropped to 50°C (122°F). Then start the engine and perform the required oil dilution. The duration of the dilution period will vary with the severity of the weather. Normal dilution periods will usually be from three to six minutes. Consult existing service publications for the exact duration of the dilution periods. The oil pressure and temperature gages should show a noticeable drop as the oil is thinned out, thus indicating that the dilution system is functioning properly. Run the engine at about 1000 rpm keeping the oil cooler shutter doors and cowl flaps open. Dilute as directed, then stop the engine in the normal manner, but hold the dilution switch "ON" until all motion stops. Do not over dilute. Do not open the throttle.

Note

Have the ground crew open the valve on the firewall above the fuel strainer; otherwise dilution will not be possible. Close the valve when dilution has been completed.

2. HOT WEATHER.

a. PREPARATION FOR FLIGHT.

(1) If operating in sandy country, ascertain that fuel and oil system filters are clean.

(2) Check that tires are not blistered or show other evidences of deterioration.

(3) While on the ground, leave fuselage door open for ventilation.

b. ENGINE WARM-UP.

(1) Starting in hot weather requires less priming.

(2) Keep engine ground running time to a minimum. Head into the wind and keep cowl flaps and oil coolers doors open for better cooling.

(3) If on sandy or dusty ground, conduct warm-up and engine tests with the airplane on any hard surface which has been swept clean of sand and pebbles.

c. TAKE-OFF.

(1) Although outside air temperature is high don't take-off until oil temperature and oil pressure readings are normal.

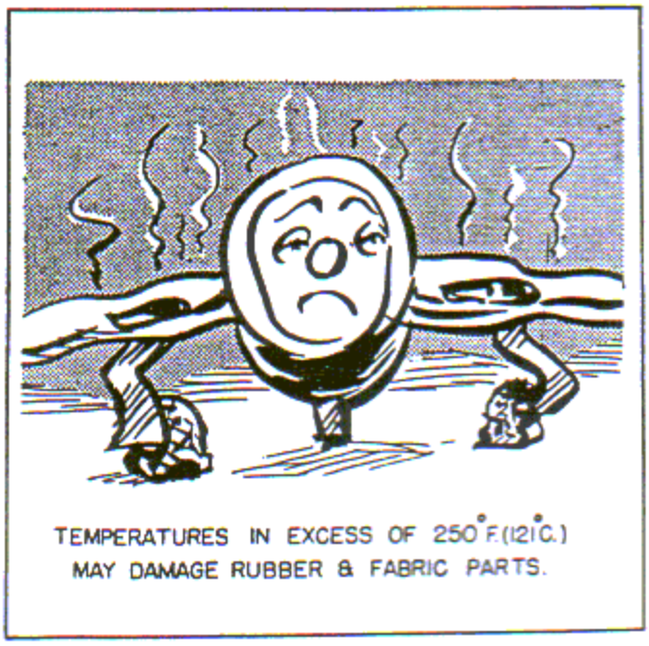
Oil Temp. 60° to 85°C.
Oil Press. 75 to 95 psi.
Cyl Hd. Temp. 130°C.

(2) Take-off and landing distances will be longer in hot weather.

(3) Low climbing speeds and low altitude flying will make the engine hotter.

(4) In hot weather watch the cylinder head temperature carefully and regulate it with the cowl flaps.

(5) If fuel pressure is low or unsteady use the auxiliary fuel pump.



APPENDIX I

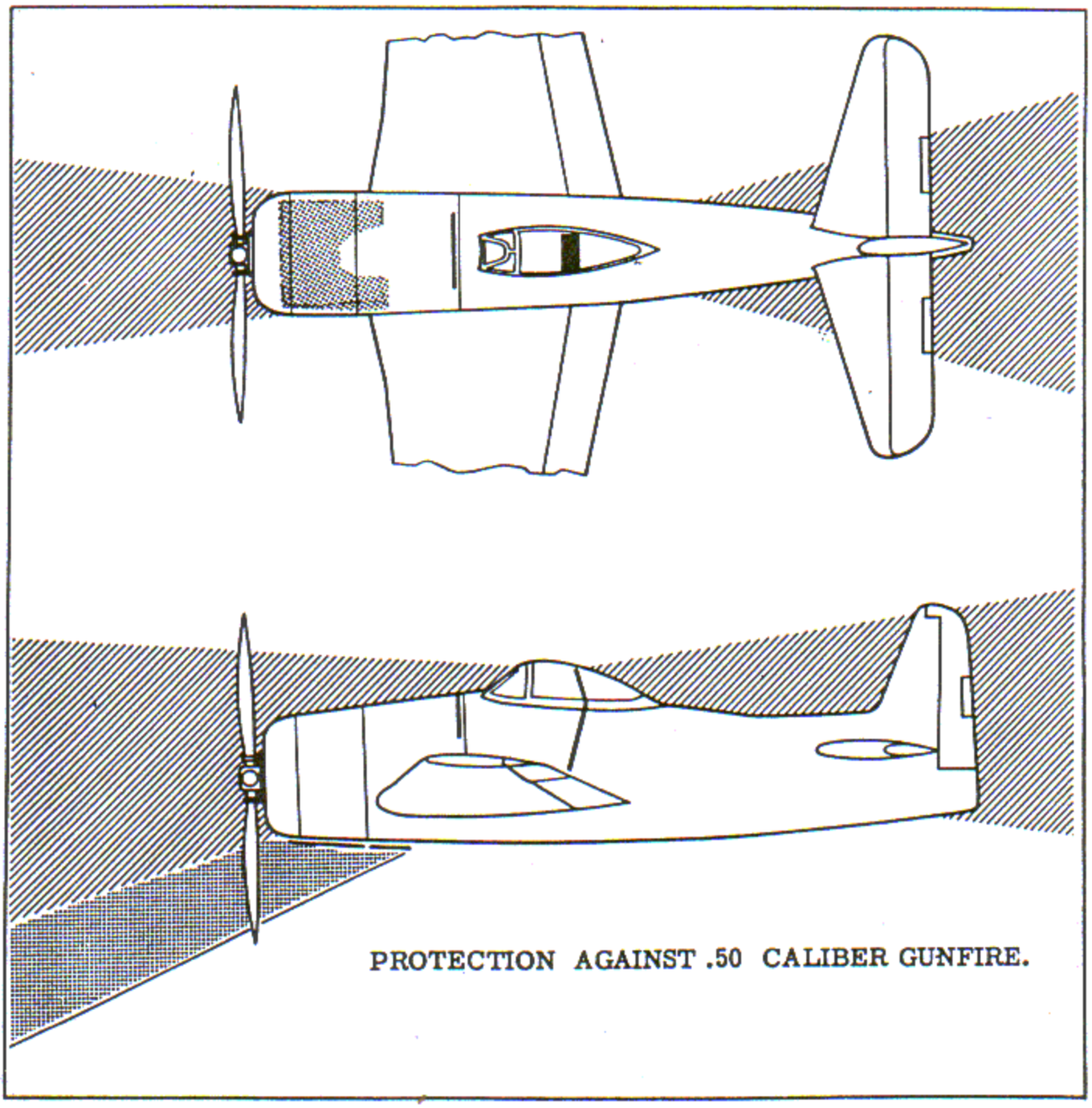


Figure 66—Protection from Gunfire Diagram

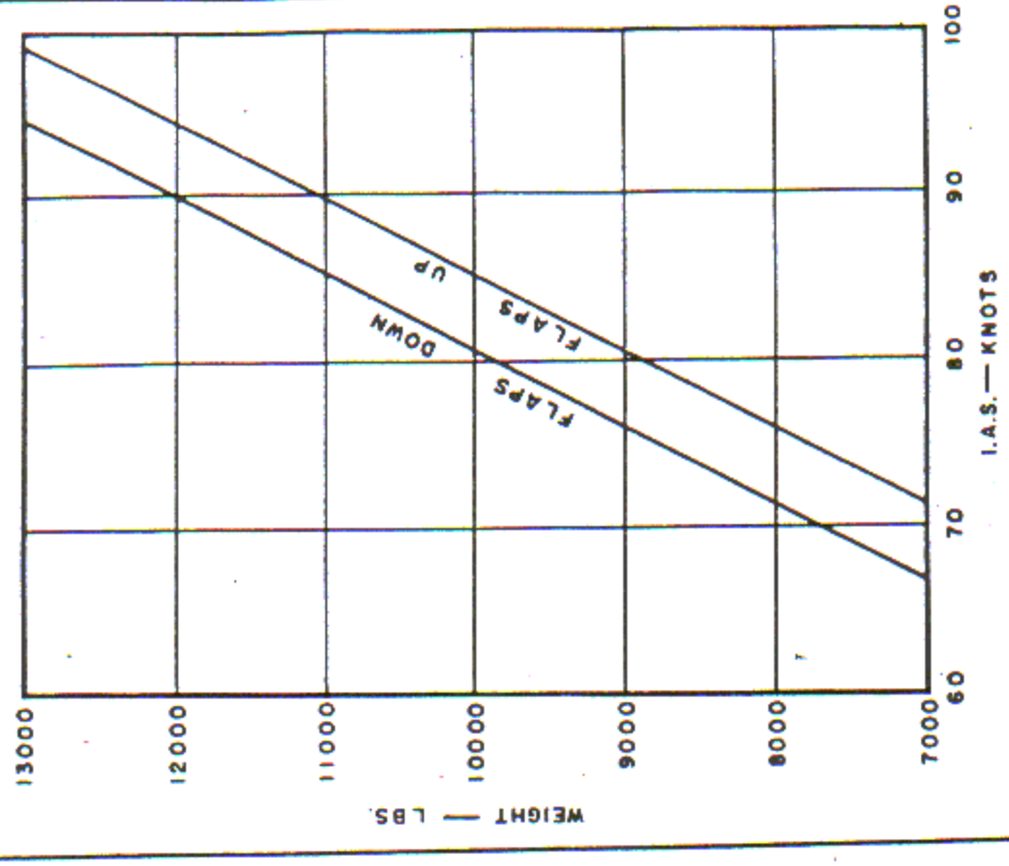


Figure 68—Stalling Speed (Power Off)—F8F-1

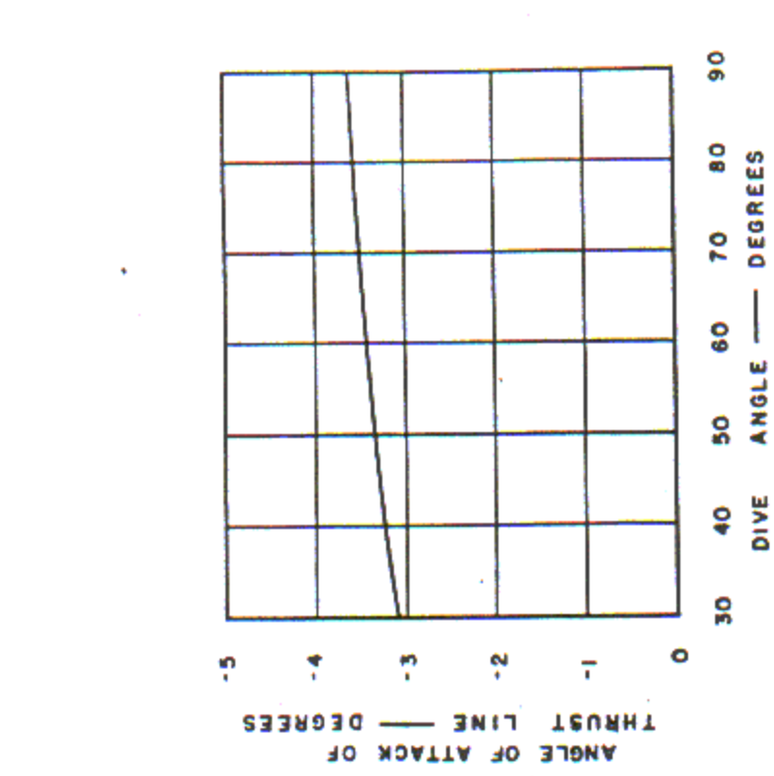


Figure 67—Dive Angle vs. Angle of Attack of Thrust Line—F8F-1

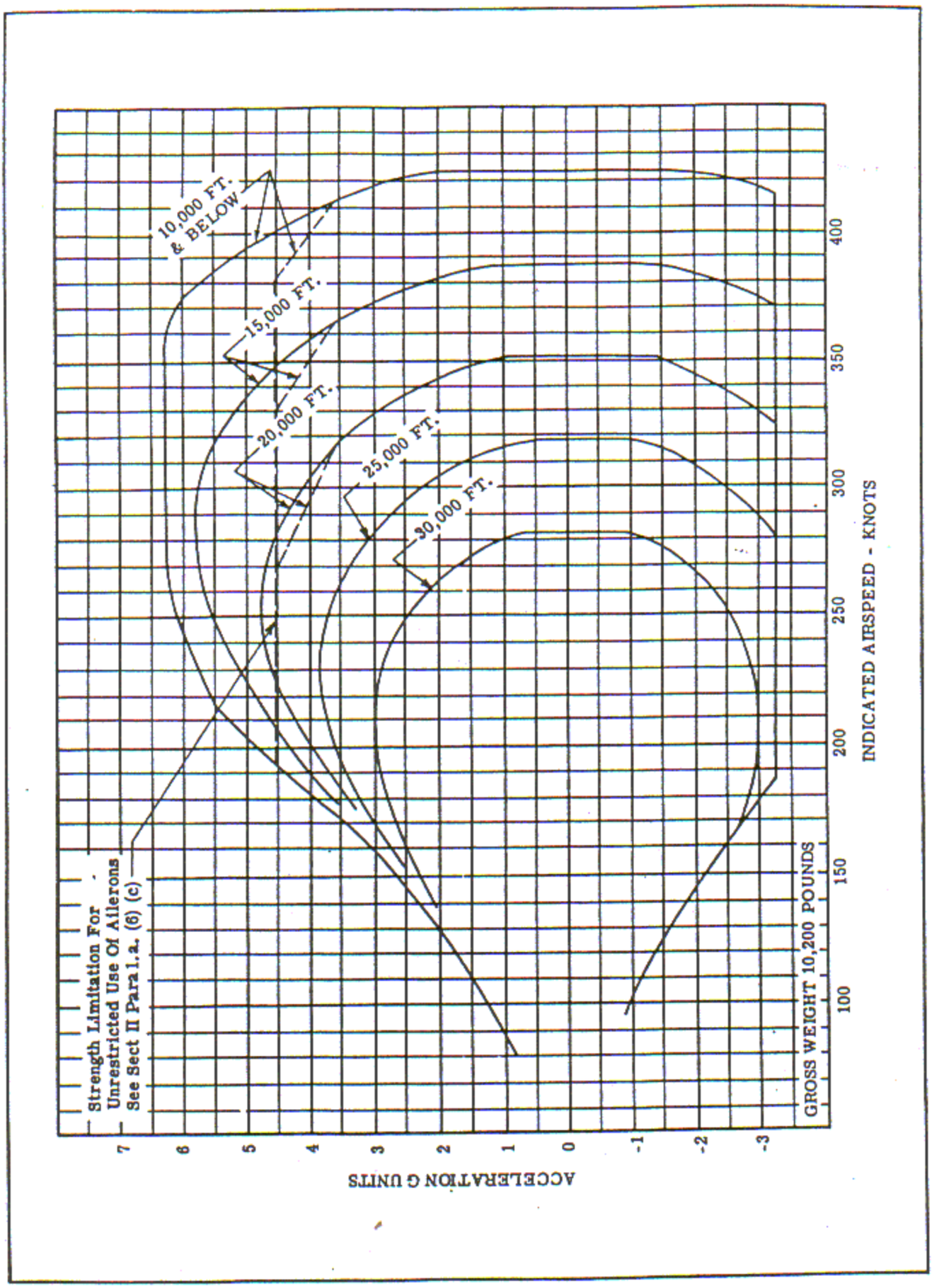


Figure 69—Operating Flight Strength Diagram Models F8F-1, -1B, -1N, -2, -2N, and -2P Airplanes

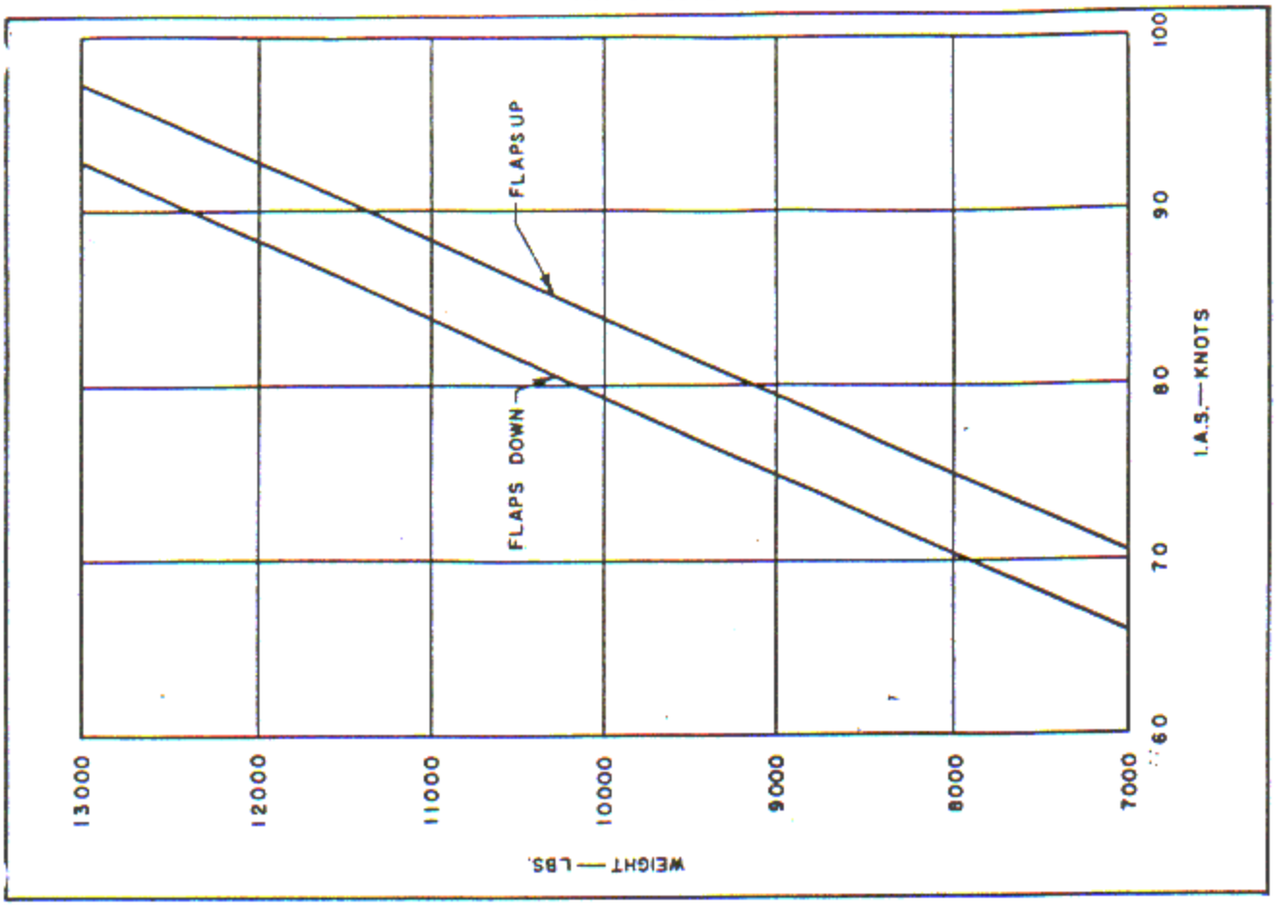


Figure 71—Stalling Speed (Power Off)—F8F-2

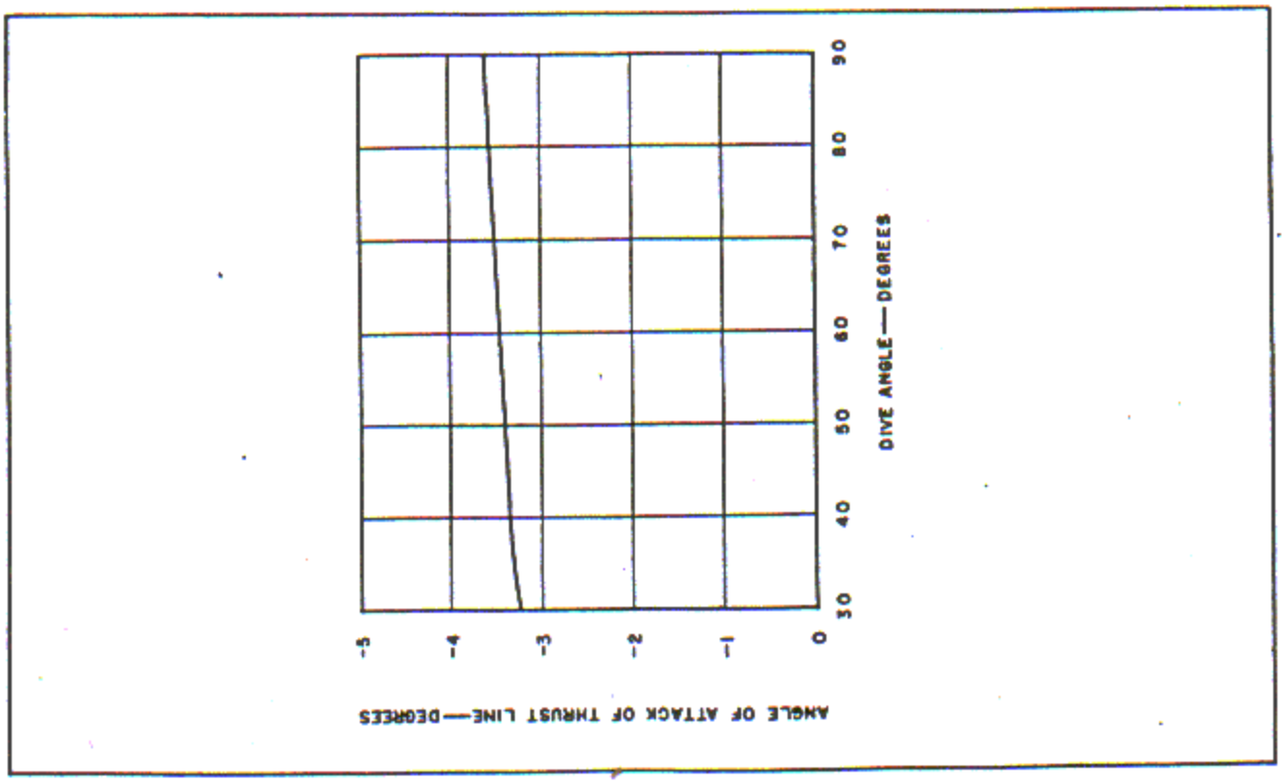


Figure 70—Dive Angle vs. Angle of Attack of Thrust Line—F8F-2

AAFHC-527
8-1-46

AIRCRAFT MODEL(S) F8F-1

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S)
R-2800-34W

TAKE-OFF DISTANCE FEET

GROSS WEIGHT LB.	HEAD WIND M.P.H.	HEAD WIND KTS.	HARD SURFACE RUNWAY AT SEA LEVEL GROUND RUN	HARD SURFACE RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	HARD SURFACE RUNWAY AT 3000 FEET GROUND RUN	HARD SURFACE RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	HARD SURFACE RUNWAY AT 6000 FEET GROUND RUN	HARD SURFACE RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT SEA LEVEL GROUND RUN	SOD-TURF RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT 3000 FEET GROUND RUN	SOD-TURF RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT 6000 FEET GROUND RUN	SOD-TURF RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT SEA LEVEL GROUND RUN	SOFT SURFACE RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT 3000 FEET GROUND RUN	SOFT SURFACE RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT 6000 FEET GROUND RUN	SOFT SURFACE RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.
9215	0	0	436	747	536	907	618	1071	447	758	550	421	670	1123	470	781	578	949	723	1176
	17	15	279	478	352	596	414	718	286	485	362	605	449	753	301	500	380	623	484	788
	34	30	149	255	197	333	241	418	153	258	202	338	262	438	161	266	212	348	282	459
	51	45	80	102	86	145	111	183	71	105	88	148	122	202	65	108	92	152	130	222
10879	0	0	666	1109	814	1361	1010	1682	670	1123	837	1384	1042	1714	714	1167	886	1433	1129	1801
1-150 GAL.	17	15	439	743	557	932	706	1178	449	753	573	949	730	1200	479	780	606	981	790	1261
DROP TANK	34	30	257	434	336	581	439	731	273	441	346	572	453	746	280	457	366	590	491	784
	51	45	120	203	195	327	232	387	123	206	201	332	240	394	131	214	213	344	260	414

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

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

DATA AS OF BASED ON:

CLIMB DATA

GROSS WEIGHT LB.	AT SEA LEVEL BEST I.A.S. MPH	AT SEA LEVEL BEST I.A.S. KTS	AT SEA LEVEL RATE OF CLIMB F.P.M.	AT SEA LEVEL GAL. OF FUEL USED	AT 5000 FEET BEST I.A.S. MPH	AT 5000 FEET BEST I.A.S. KTS	AT 5000 FEET RATE OF CLIMB F.P.M.	AT 5000 FEET FROM SEA LEVEL TIME MIN.	AT 5000 FEET FROM SEA LEVEL FUEL USED	AT 10,000 FEET BEST I.A.S. MPH	AT 10,000 FEET BEST I.A.S. KTS	AT 10,000 FEET RATE OF CLIMB F.P.M.	AT 10,000 FEET FROM SEA LEVEL TIME MIN.	AT 10,000 FEET FROM SEA LEVEL FUEL USED	AT 15,000 FEET BEST I.A.S. MPH	AT 15,000 FEET BEST I.A.S. KTS	AT 15,000 FEET RATE OF CLIMB F.P.M.	AT 15,000 FEET FROM SEA LEVEL TIME MIN.	AT 15,000 FEET FROM SEA LEVEL FUEL USED	AT 20,000 FEET BEST I.A.S. MPH	AT 20,000 FEET BEST I.A.S. KTS	AT 20,000 FEET RATE OF CLIMB F.P.M.	AT 20,000 FEET FROM SEA LEVEL TIME MIN.	AT 20,000 FEET FROM SEA LEVEL FUEL USED	AT 25,000 FEET BEST I.A.S. MPH	AT 25,000 FEET BEST I.A.S. KTS	AT 25,000 FEET RATE OF CLIMB F.P.M.	AT 25,000 FEET FROM SEA LEVEL TIME MIN.	AT 25,000 FEET FROM SEA LEVEL FUEL USED
9215	177	154	4050	14	192	167	4000	1.00	18	200	174	3700	2.13	21	210	182	3390	3.36	27	215	187	3080	4.8	31	220	191	2250	6.6	35
10879	177	154	3100	14	192	167	3080	1.25	19	200	174	2900	2.65	23	210	182	2530	4.21	29	215	187	2240	6.1	35	220	191	1500	8.4	41

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

DATA AS OF BASED ON:

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

LANDING DISTANCE FEET

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

DATA AS OF BASED ON:

OPTIMUM LANDING IS 80% OF CHART VALUES

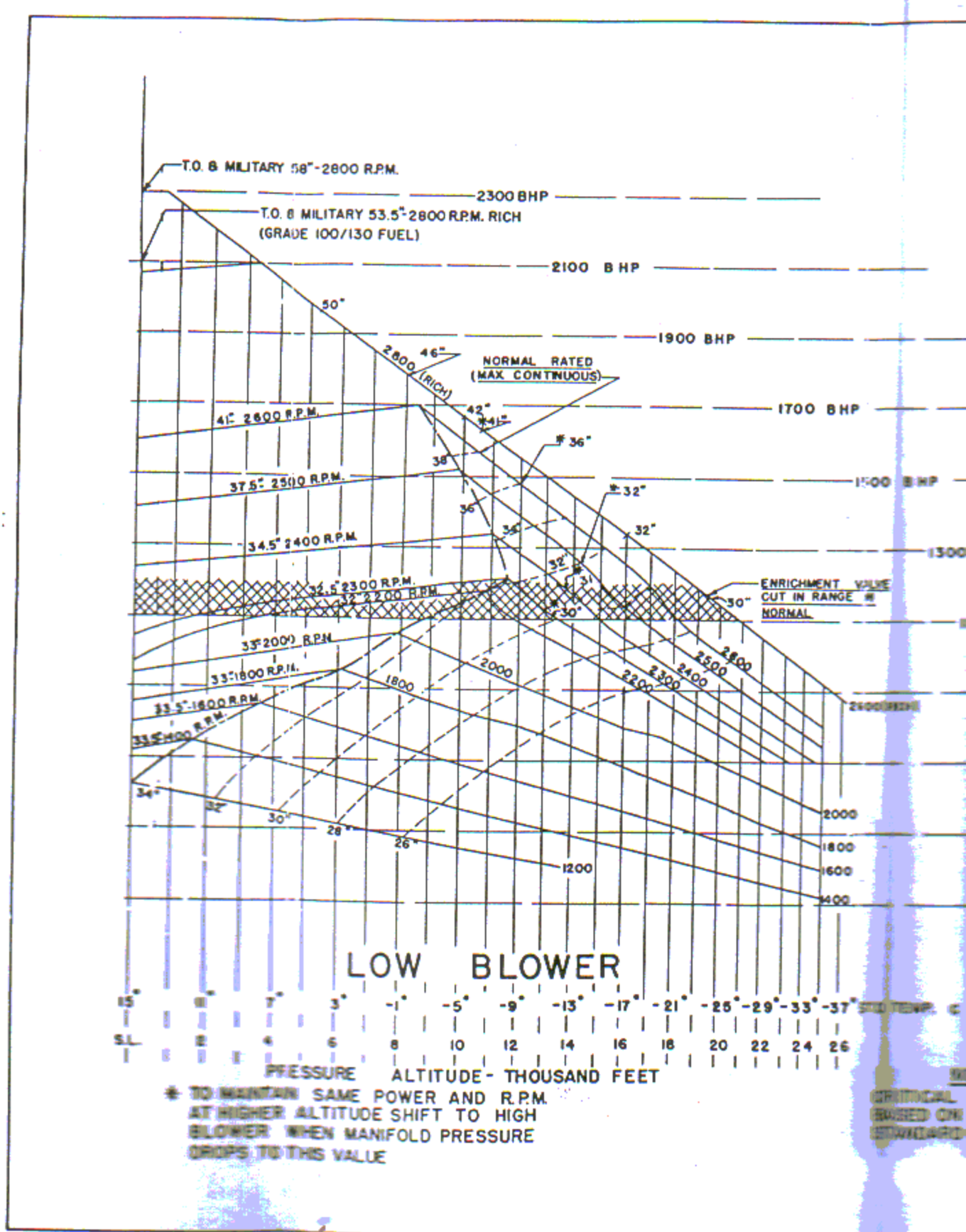
REMARKS:

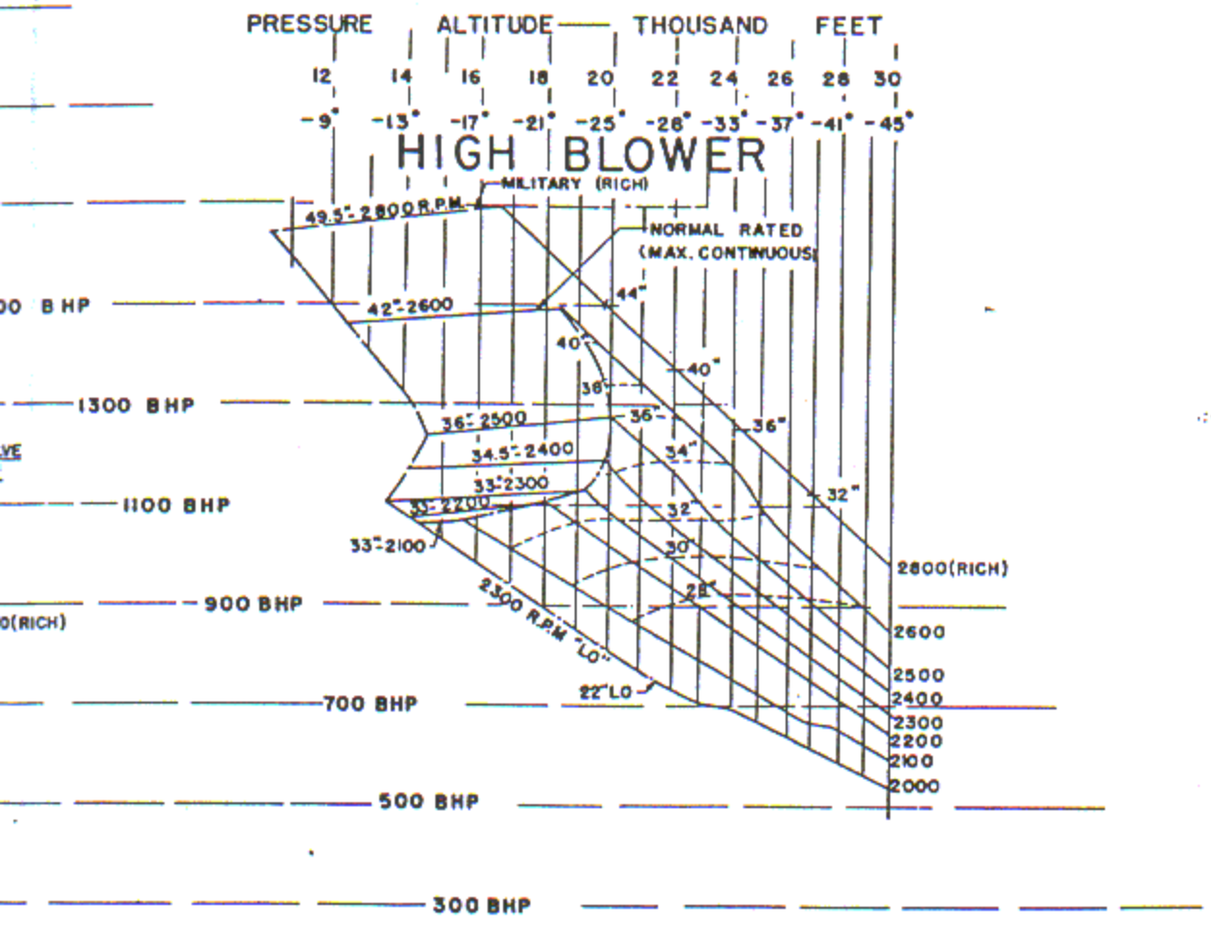
NOTE: TO DETERMINE FUEL CONSUMPTION IN BRITISH IMPERIAL GALLONS, MULTIPLY BY 10, THEN DIVIDE BY 12

LEGEND

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

Figure 72—Take Off, Climb and Landing Chart


T.O. 8 MILITARY 58"-2800 R.P.M.
2300 BHP
T.O. 8 MILITARY 53.5"-2800 R.P.M. RICH
(GRADE 100/130 FUEL)
2100 B HP
1900 BHP
1700 BHP
1500 B HP
1300
50"
46"
2800 (RICH)
NORMAL RATED
(MAX. CONTINUOUS)
42"
*41"
41" 2600 R.P.M.
*36"
38"
37.5" 2510 R.P.M.
36"
*32"
34.5" 2400 R.P.M.
34"
32"
32.5" 2300 R.P.M.
32" 2200 R.P.M.
*31"
32"
30"
ENRICHMENT VALVE
CUT IN RANGE *
NORMAL
30"
33" 2000 R.P.M.
33" 1800 R.P.M.
33.5" 1600 R.P.M.
33.5" 1400 R.P.M.
1800
2000
2200
2300
2400
2500
2800
34"
32"
30"
28"
26"
1200
2000
1800
1600
1400
LOW BLOWER
15° 11° 7° 3° -1° -5° -9° -13° -17° -21° -25° -29° -33° -37° STD TEMP. C
S.L. 2 4 6 8 10 12 14 16 18 20 22 24 26
PRESSURE ALTITUDE - THOUSAND FEET
* TO MAINTAIN SAME POWER AND R.P.M. AT HIGHER ALTITUDE SHIFT TO HIGH BLOWER WHEN MANIFOLD PRESSURE DROPS TO THIS VALUE



R-2800 — 34 W
OPERATING LIMITS CHART

GRADE 115/145 SPEC. AN-F-48 FUEL. BASED ON A.E.L. CALIBRATION
USE RICH FOR ALL OPERATIONS ABOVE 2600 R.P.M. USE NORMAL FOR FLIGHT OPERATIONS AT 2600 R.P.M. AND BELOW, PROVIDED CYLINDER HEAD TEMPERATURES ARE NOT EXCEEDED

TD. TEMP. C

NOTE:
CRITICAL ALTITUDES ARE BASED ON ZERO RAM AND STANDARD AIR

Figure 73—Engine Calibration Curves—F8F-1—R-2800-34W

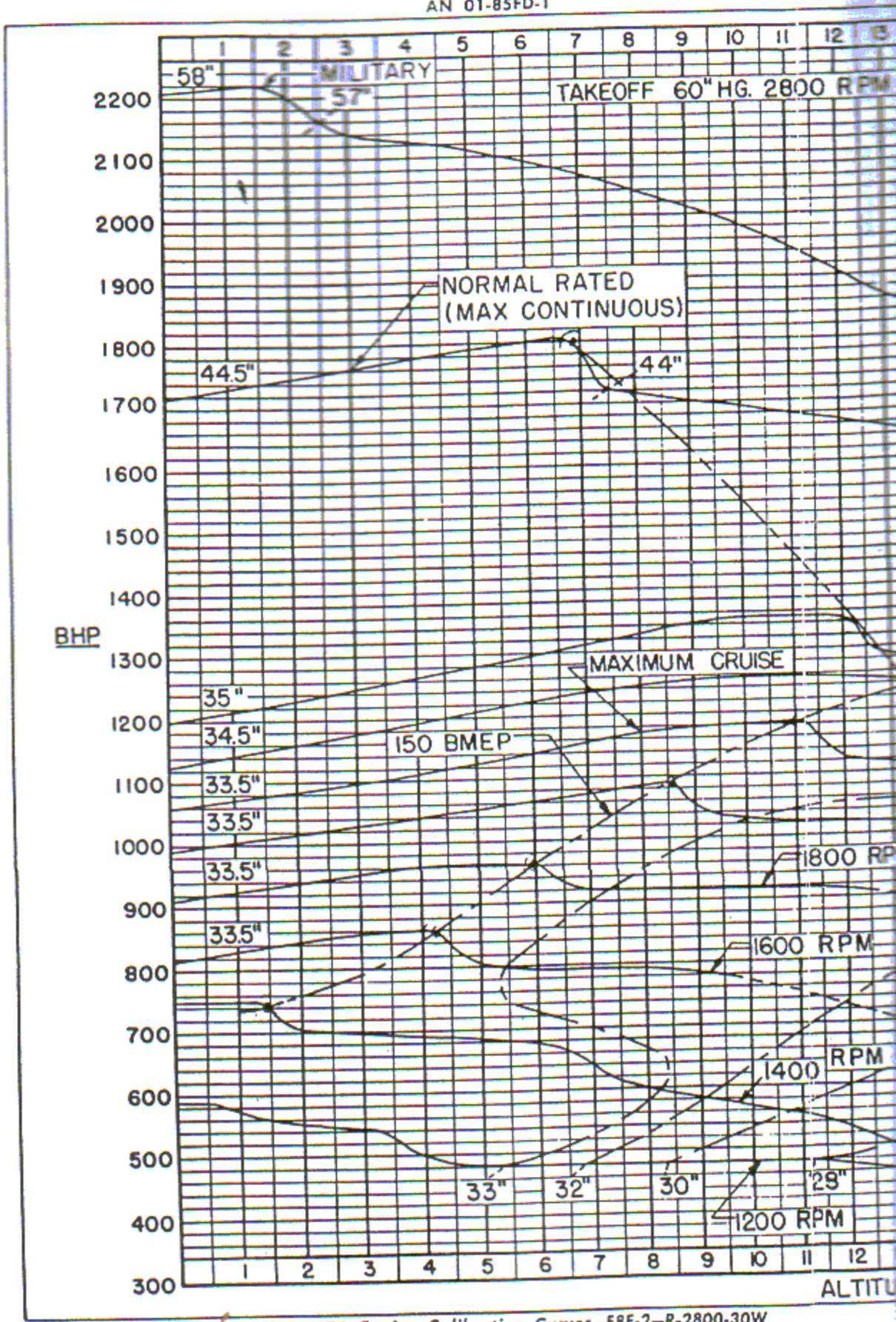
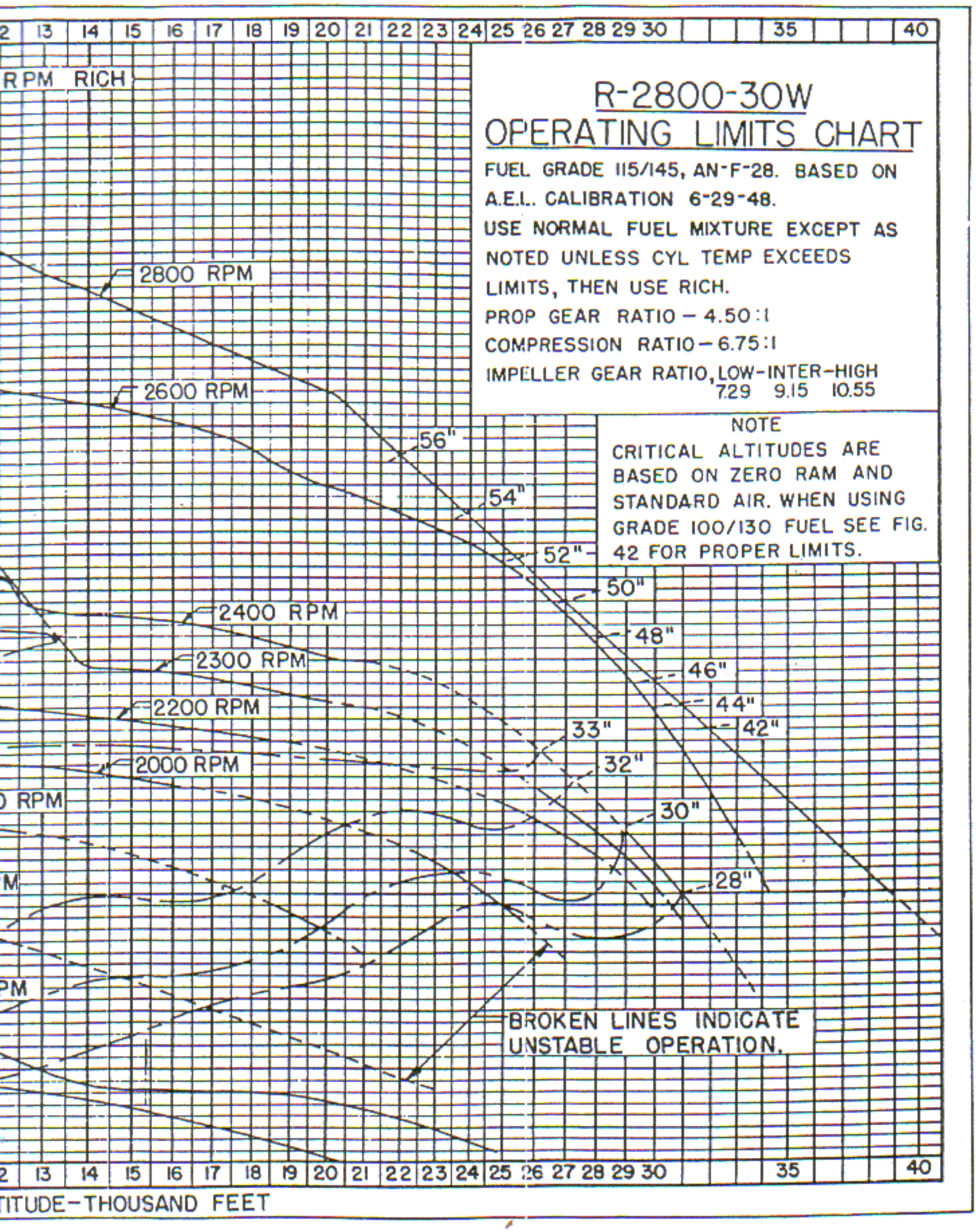


Figure 74—Engine Calibration Curves—F8F-2—R-2800-30W



R-2800-30W
OPERATING LIMITS CHART

FUEL GRADE 115/145, AN-F-28. BASED ON A.E.I. CALIBRATION 6-29-48.

USE NORMAL FUEL MIXTURE EXCEPT AS NOTED UNLESS CYL TEMP EXCEEDS LIMITS, THEN USE RICH.

PROP GEAR RATIO – 4.50:1

COMPRESSION RATIO – 6.75:1

IMPELLER GEAR RATIO, LOW-INTER-HIGH
7.29 9.15 10.55

NOTE

CRITICAL ALTITUDES ARE BASED ON ZERO RAM AND STANDARD AIR. WHEN USING GRADE 100/130 FUEL SEE FIG. 42 FOR PROPER LIMITS.

AAFHC-513
8-1-41

AIRCRAFT MODEL(S): F8F-2

ENGINE(S): R-2800-10W

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 11231

EXTERNAL LOAD ITEMS
1- 150 GAL. DROP TANK

	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.	FOR DETAILS SEE POWER PLANT CHART SECT. III
LIMITS								
WAR EMERG.								
MILITARY POWER	2800	60	LOW	RICH	30 MIN.	260°C	310	

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V GIVE PROGRESSIVE INCREASE IN RANGE AT A SACRIFICE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.) MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
		335	555	484	666	577	776	675	335		
		300	540	470	650	562	756	656	300		
		260	480	418	577	499	672	584	260		
		220	420	366	505	436	588	510	220		
		180	360	314	432	374	505	438	180		
		140	300	261	360	312	420	365	140		
		100	240	209	288	250	336	292	~~100~~		
		60	180	157	216	187	252	191	60		

MAXIMUM CONTINUOUS					PRESS ALT. FEET	(2.5 STAT. (2.17 NAUT.) MI./GAL.)						(3.1 STAT. (2.69 NAUT.) MI./GAL.)						(3.7 STAT. (3.22 NAUT.) MI./GAL.)						MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
					40000																								
					30000																								
2600	44.8	NORM.	179	416	362	25000	2470	39.5	NORM.	130	391	339	2300	34.1	NORM.	98	357	310	2120	27.7	NORM.	71	300	261	25000	2080	26.8	NORM.	75	270	234
2600	47.5	NORM.	170	411	357	20000	2230	40.8	NORM.	124	374	324	2080	35.4	NORM.	94	342	297	1960	30.4	NORM.	71	300	261	20000	1850	28.5	NORM.	58	248	216
2600	47.5	NORM.	196	402	349	15000	2250	38.0	NORM.	120	365	317	1940	37.2	NORM.	91	327	284	1810	33.0	NORM.	69	290	252	15000	1800	29.0	NORM.	47	228	198
2600	47.5	NORM.	204	387	336	10000	2020	40.2	NORM.	116	348	302	1880	37.2	NORM.	90	325	282	1500	37.8	NORM.	70	295	256	10000	1600	31.0	NORM.	43	211	183
2600	47.5	NORM.	224	379	329	S000	2260	33.8	NORM.	108	325	282	1830	32.1	NORM.	83	300	261	1420	37.3	NORM.	65	275	239	S000	1400	29.5	NORM.	39	195	169
2600	48.7	NORM.	224	361	314	S.L.	2160	35.0	NORM.	100	305	265	1780	33.8	NORM.	77	280	243	1400	37.0	NORM.	60	255	222	S.L.	1400	35.0	NORM.	37	181	157

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) FUEL FLOWS HAVE BEEN INCREASED 18%

EXAMPLE

AT 11230 LB. GROSS WEIGHT WITH 220 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 29 GAL.) TO FLY 815 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 1840 RPM AND 34.1 IN. MANIFOLD PRESSURE WITH MIXTURE SET: NORMAL

LEGEND

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

DATA AS OF 12-16-48 BASED ON: ENGINE SPEC.

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

Figure 75 (Sheet 1 of 3 Sheets)—Flight Operation Instruction Charts

AAFAC-529 6-1-48

AIRCRAFT MODEL(S) F8F-2

ENGINE(S): R-2800-30W

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 10331

EXTERNAL LOAD ITEMS NONE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2800	60		RICH	30 MIN.	260°C	310

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

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1]. MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V GIVE PROGRESSIVE INCREASE IN RANGE AT A SACRIFICE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[2]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I RANGE IN AIRMILES STAUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
		185	837	728	1040	901	1240	1090	185		
		180	750	652	930	807	1110	966	180		
		160	650	565	806	700	962	838	160		
		140	550	479	682	592	815	710	140		
		120	480	392	559	485	666	580	120		
		100	350	304	435	376	518	451	100		
		80	250	217	310	269	370	322	80		
		60	150	131	186	162	222	194	60		

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(3.0 STAT. (2.61 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(3.6 STAT. (3.12 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(4.20 STAT. (3.65 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
2600	44.8	NORM.	179	392	340	25000	2540	42.2	NORM.	50	375	326	2380	36.4	NORM.	12	350	304	2170	29.0	NORM.	79	290	252	25000	2140	28.8	NORM.	59	270	235
2600	47.5	NORM.	170	388	337	20000	2600	39.5	NORM.	48	368	320	2160	38.1	NORM.	08	336	292	2010	32.0	NORM.	78	290	252	20000	1930	29.4	NORM.	81	248	215
2600	47.5	NORM.	196	383	333	15000	2320	40.0	NORM.	40	355	308	2210	37.1	NORM.	10	338	294	1840	34.1	NORM.	75	280	243	15000	1720	30.8	NORM.	53	228	198
2600	47.5	NORM.	204	366	318	10000	2330	35.4	NORM.	33	332	288	1960	39.1	NORM.	03	320	278	1780	35.7	NORM.	79	290	252	10000	1600	32.3	NORM.	49	211	183
2600	47.5	NORM.	224	359	312	5000	2350	35.8	NORM.	27	315	274	2060	33.0	NORM.	35	295	256	1630	33.0	NORM.	73	270	234	5000	1400	30.2	NORM.	45	195	169
2600	48.7	NORM.	224	343	298	S.L.	2320	36.8	NORM.	18	295	256	1970	35.0	NORM.	30	278	242	1530	37.0	NORM.	67	248	214	S.L.	1400	35.0	NORM.	42	181	157

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) FUEL FLOWS HAVE BEEN INCREASED 10%

EXAMPLE

AT 10330 LB. GROSS WEIGHT WITH 120 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 10 GAL.) TO FLY 432 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 1880 RPM AND 37.2 IN. MANIFOLD PRESSURE WITH MIXTURE SET: NORMAL

LEGEND

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

DATA AS OF 12-16-48 BASED ON: ENGINE SPEC.

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

Figure 75 (Sheet 2 of 3 Sheets)—Flight Operation Instruction Charts

AAFTC-428 4-1-45

AIRCRAFT MODEL(S) F8F-2N

ENGINE(S): R-2800-30W

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: WT=10672

EXTERNAL LOAD ITEMS
1 RADAR BULB

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL B.P.H.
WAR EMERG.							
MILITARY POWER	2800	60	LOW	RICH	30 MIN.	260°	310

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

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V GIVE PROGRESSIVE INCREASE IN RANGE AT A SACRIFICE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[2]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I			FUEL	COLUMN II						COLUMN III						COLUMN IV						FUEL	COLUMN V					
RANGE IN AIRMILES			U.S.	RANGE IN AIRMILES						RANGE IN AIRMILES						RANGE IN AIRMILES						U.S.	RANGE IN AIRMILES					
STAUTE		NAUTICAL	GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																									
			185	426		370				500		443				592		515				185						
			180	414		360				495		430				576		500				180						
			160	368		320				440		383				512		445				160						
			140	322		280				385		335				447		390				140						
			120	276		240				330		287				384		334				120						
			100	230		200				275		239				320		278				100						
			80	184		160				220		192				256		222				80						
			60	138		120				165		144				192		167				60						
MAXIMUM CONTINUOUS				(2.3 STAT. (2.0 NAUT.) MI./GAL.)						(2.75 STAT. (2.39 NAUT.) MI./GAL.)						(3.20 STAT. (2.78 NAUT.) MI./GAL.)							MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	PRESS ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	PRESS ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
2600	44.8	NORM.	179	381	331	25000	2570	41.4	NORM.	163	373	324	2460	39.3	NORM.	128	356	306							25000	2170	29.5	NORM.	78	264	228
2600	47.5	NORM.	170	376	326	20000	2560	46.0	NORM.	159	370	321	2400	41.0	NORM.	121	343	298	2170	38.2	NORM.	99	319	279	20000	1940	30.0	NORM.	69	242	210
2600	47.5	NORM.	196	371	322	15000	2360	36.6	NORM.	146	340	295	2110	40.8	NORM.	116	320	278	2160	35.8	NORM.	99	318	276	15000	1710	31.0	NORM.	59	223	194
2600	47.5	NORM.	204	359	312	10000	2330	39.2	NORM.	139	320	278	2020	38.0	NORM	112	305	265	1840	36.0	NORM	91	290	252	10000	1600	32.8	NORM.	50	206	179
2600	47.5	NORM.	224	351	305	5000	2380	36.7	NORM.	138	310	268	2190	35.2	NORM.	107	295	256	1930	35.0	NORM.	87	280	243	5000	1400	30.4	NORM.	46	190	165
2600	48.7	NORM.	224	335	291	S.L.	2410	35.5	NORM.	124	290	252	2180	37.0	NORM.	102	280	243	1835	34.1	NORM	82	263	227	S.L.	1400	35.2	NORM.	43	177	154

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) FUEL FLOWS HAVE BEEN INCREASED 10%

EXAMPLE

AT 10672 LB. GROSS WEIGHT WITH 160 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 19 GAL.) TO FLY 447 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 1910 RPM AND 37.9 IN. MANIFOLD PRESSURE WITH MIXTURE SET: NORMAL

LEGEND

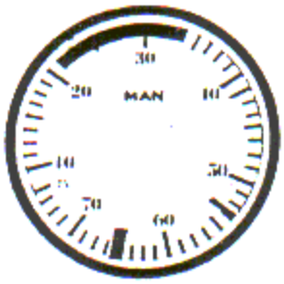
ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
RICH : RICH
NORM: NORMAL
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 12-16-48 BASED ON: ENGINE SPEC.

RED FIGURES ARE PRELIMINARY DATA SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure 75 (Sheet 3 of 3 Sheets)—Flight Operation Instruction Charts

MANIFOLD PRESSURE

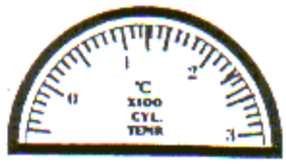


- Cruising 21 to 34 in. Hg
- Max Continuous Power 41 in. Hg
- Military Power 53.5 in. Hg
- Combat Power 65 in. Hg

TACHOMETER

- Cruising 1250 to 2300 rpm
- Max. Continuous Power 2600 rpm
- Military & Combat Power 2800 rpm

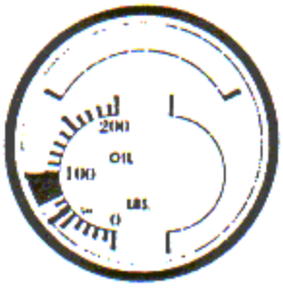
CYLINDER HEAD TEMPERATURE



Min. For Take-off	130° C
Operating Range	232° C
Maximum (For One Hour)	260° C

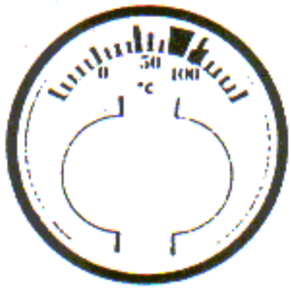
ENGINE GAGE UNIT

OIL PRESSURE



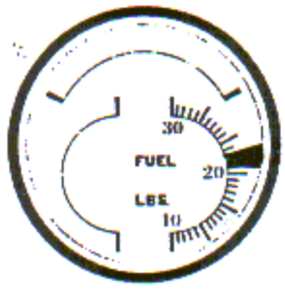
- Minimum 60 psi
- Normal 75 to 95 psi
- Maximum 100 psi

OIL IN TEMPERATURE



- Minimum 40° C
- Normal Range 65 to 85° C
- Maximum 95° C

FUEL PRESSURE



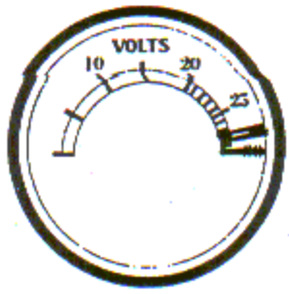
- Minimum 21 psi
- Operating Range 21 to 23 psi
- Maximum 23 psi

NOTES

1. Refer to engine power charts for setting limitations desired

2. The above gage readings will not necessarily be obtainable on all instruments at the same time.

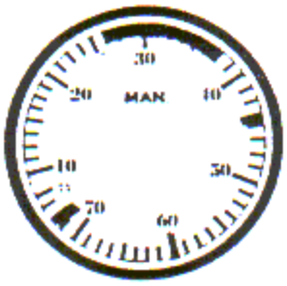
VOLTMETER



- Minimum 27.5 V
- Desired Output 28.0 to 28.5V
- Maximum 30V

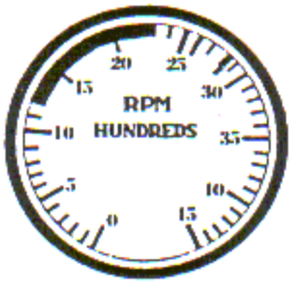
Figure 76—Instrument Operation Limits—F8F-1

MANIFOLD PRESSURE



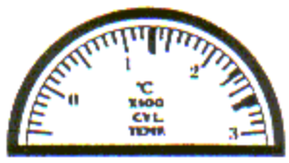
- Cruising 26 to 38 in. Hg
- Max Continuous Power 44.5 in. Hg
- Military Power 60 in. Hg
- Combat Power 72 in. Hg

TACHOMETER



- Cruising 1200 to 2300 rpm
- Max. Continuous Power 2600 rpm
- Military & Combat Power 2800 rpm

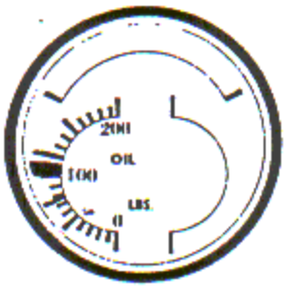
CYLINDER HEAD TEMPERATURE



- Min. For Take-off 130°C
- Operating Range 232°C
- Maximum 260°C
  (For 30 Min.)

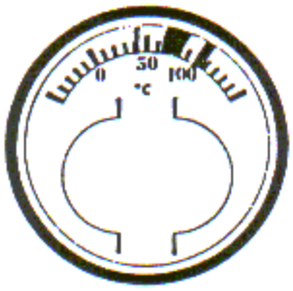
ENGINE GAGE UNIT

OIL PRESSURE



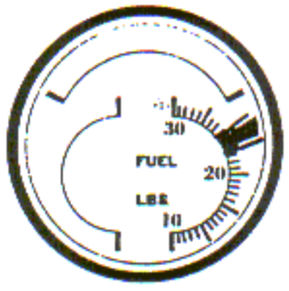
- Minimum 80 psi
- Normal 100 to 110 psi
- Maximum 120 ± 5

OIL IN TEMPERATURE



- Minimum 40°C
- Normal Range 65 to 85°C
- Maximum 100°C

FUEL PRESSURE



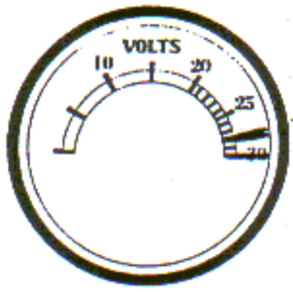
- Minimum 24 psi
- Operating Range 24-26 psi
- Maximum 27 psi
  (with both pumps operating)

NOTES

1. Refer to engine power charts for setting limitations desired.

2. The above gage readings will not necessarily be obtainable on all instruments at the same time.

VOLTMETER



- Minimum 27.5 V
- Desired Output 28.0 to 28.5V
- Maximum 30V

Figure 77—Instruments Operation Limits—F8F-2

Appendix II 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.

RESTRICTED
AN 01-85FD-1

PRELIMINARY ISSUE
SUPPLEMENTARY OPERATING INSTRUCTIONS
MODEL F8F-1 AIRPLANE

1. ORIGIN AND SCOPE OF DATA

The data presented in this preliminary issue of F8F-1 Airplane Supplementary Operating Instructions are based on the results of flight tests conducted on a model F8F-1 airplane, BuNo 90439, at the Naval Air Test Center, Patuxent River, Maryland. Fuel consumption tables are given for AUTO LEAN operation in LOW BLOWER at calibrated airspeeds from 140 Kts. to 240 Kts. at gross weights of 9000, 9500, and 10000 lbs. with and without a 150-gal. universal centerline droppable fuel tank. Tests were run at density altitudes ranging from sea level to 16,000 feet.

All tabulated fuel flow values are direct readings of the flowmeter installed between the carburetor and the engine in the test airplane. The rate of vapor-return fuel flow was not measured. In the case of a flight with drop tank installed and a full fuselage tank due caution must be observed to prevent loss of fuel by consuming a sufficient amount of fuel from the fuselage tank at the beginning of the flight to allow room for vapor-return fuel.

Fuel flows obtained by manual leaning were not determined, but instructions for manual leaning are included in this publication.

2. CONDITIONS OF THE FLIGHT TEST

The test airplane was equipped with a Pratt and Whitney model R-2800-34W engine, an Aeroproducts four-blade propeller (Blade Design No. H20C-162-11M5), and a Stromberg model PR58E2 carburetor, setting (Parts List Number) 395516-11. This setting is very close to the average metering curve determined for PR58E2 Carburetors of Parts List No. 395516-12.

Throughout the tests, the airplane was flown in the following drag conditions:

(a) Outside air temperature gauge, electrical resistance type, on lower right wing panel.
(b) Sealed over gun blast tunnels and gun camera opening.
(c) Open shell ejection chutes.
(d) AT-8/AR (VHF) radio antenna on fuselage forward of dorsal fin.
(e) AT-5/ARR-1(HOMING) radio antenna on lower left wing panel.
(f) AN-32/APX-1(IFF) radio antenna on lower right wing panel.
(g) Radio aerial extending from rudder to fuselage aft of cockpit.
(h) Prototype fin having 2^{o} offset.
(i) Dive recovery flaps NOT installed.
(j) Wing bomb racks NOT installed.

3. USE OF TABLES

The tables presenting the data are arranged in the following order:

Maximum Cruise - Clean configuration
Maximum Cruise - With 150-gal. drop tank
140 Knots CAS - Clean configuration
140 Knots CAS - With drop tank
160 Knots CAS - Clean configuration
160 Knots CAS - With drop tank
180 Knots CAS - Clean configuration
180 Knots CAS - With drop tank
190 Knots CAS - Clean configuration

200 Knots CAS - Clean configuration
200 Knots CAS - With drop tank
220 Knots CAS - Clean configuration
220 Knots CAS - With drop tank
240 Knots CAS - Clean configuration
240 Knots CAS - With drop tank

All the values in the tables should correlate closely in flights with other F8F airplanes only under standard conditions. Standard conditions occur when the outside air temperature at the pressure altitude being flown corresponds to the standard temperature for that altitude. In standard conditions, the "pressure altitude" and the "density altitude" will coincide. The effect of moisture content is not considered in these instructions.

Under standard conditions the tabulated CAS and GPH will be obtained with the corresponding tabulated MP and RPM. Under non-standard conditions close correlation between airspeeds and power settings should not be expected. However, by entering the standard altitude column of these tables with density altitude and using calibrated airspeed as a guide in setting up power, the resulting rate of fuel consumption at that CAS can be read directly from the tables. The power settings necessary to obtain any desired airspeed should be set up as follows for any flight condition:

(a) Any airspeed less than that attainable at 1400 RPM and 32.0 in. MP should be obtained by adjusting the manifold pressure and holding 1400 RPM.

(b) Any airspeed in excess of that attainable at 1400 RPM and 32.0 in. MP should be obtained by adjusting the RPM and holding 32.0 in. MP. If 32.0 in. cannot be obtained at full throttle, use full throttle and adjust RPM as desired. 1400 RPM is minimum recommended RPM for cruising.

4. EXAMPLE OF THE USE OF THE TABLES.

A flight is to be made at 160 knots CAS, 9500 lb. gross weight, at 4000 feet Pressure Altitude in the clean configuration. The OAT at that altitude is 15°C. What fuel flow may be expected and what will be the approximate power settings?

The first step is to find the Density Altitude by using the Density Altitude Graph or the Mk8A Computer, if available. At 4000 feet PA and 15°C the Density Altitude is 5000 feet. With this altitude enter the column marked "STD.ALT." in the table headed "160 KNOTS CAS". Since this table shows data for 4000 and 6000 feet a simple interpolation is necessary. The predicted fuel consumption is 41.3 gallons per hour and the approximate power settings are 23 inches and 1400 RPM.

At a given weight and configuration the power and, hence, the fuel flow requirements of the airplane are fixed by the density altitude and the CAS at which the airplane is flown. This is evident because the airplane's True Airspeed depends on density altitude and CAS alone. Since in this example, the airplane is actually flying at 5000 feet density altitude (although the altimeter reads 4000 feet pressure altitude), the fuel flow value will be 41.3 GPH at 160 knots CAS, as charted. On another day, if the temperature at 4000 feet PA is 7°C., the density altitude will also be 4000 feet. On a colder day, at a PA of 6000 feet and a temperature of -6°C the density altitude will again be 5000 feet and the airplane's fuel flow requirements will again be 41.3 GPH at 160 knots CAS.

It must be remembered that, at the same pressure altitude, for a given MP d RPM, an increase in air temperature will decrease the power output. The bles give power settings to obtain certain calibrated airspeeds under standard conditions. Therefore, on a day colder than standard, the power settings required will be slightly reduced and on a warm day they must be increased.

5. AIRSPEED CALIBRATION

The airspeed calibration of the test airplane, Figure 1, indicates that the difference between indicated airspeed and calibrated airspeed is small enough to be disregarded within the speed range covered by these charts. However, this calibration may not be representative of other F8F airplanes, and therefore, all airplanes should be checked for airspeed calibration unless recent data are readily available. Pacing the airplane to be calibrated against another airplane of known calibration should yield satisfactory results.

6. MAXIMUM RANGE AIRSPEED - AUTO LEAN

Maximum range airspeeds in AUTO LEAN for the two configurations tested are as follows:

(a) Clean configuration (no external load items) - 190 knots CAS.

(b) With 150-gallon droppable tank under fuselage - 180 knots CAS.

7. MAXIMUM RANGE AIRSPEED - MANUAL LEAN

Although the AUTO LEAN Setting of the carburetor is designed to provide a mixture at fuel-air ratios near best economy above a certain power output, at relatively low airspeeds in part-throttle conditions, the power requirements of the F8F Airplane are of such a value that the carburetor will provide excessively rich mixtures due to idle enrichment. The results are analogous to ground operation at idling RPM's where the idling jets of the carburetor meter the fuel at fuel-air ratios higher than best economy in order to provide satisfactory engine cooling.

In flight, however, where engine cooling is not critical at cruising powers, operation in the idle enrichment range results in a waste of fuel. The idle enrichment in this engine-carburetor combination begins to take place at approximately 630 BHP with the mixture control in AUTO LEAN, and becomes progressively worse at lower powers. It must be emphasized here that engine operation in AUTO LEAN in the idle enrichment range is entirely satisfactory EXCEPT from the standpoint of fuel economy.

The region in which manual leaning is permissible is shown on the accompanying charts. The line of demarcation below which manual leaning may be performed represents the conditions where idle enrichment begins. No improvement in fuel economy would result in manual leaning above this power.

Pending results of manual leaning flight tests the following technique for manual leaning is suggested. Use the power settings for AUTO LEAN operation determined by the procedure outlined in Section 3. Retard the mixture control smoothly toward the Idle Cut-Off position until the first indication of engine roughness is felt or heard. (During the leaning-out process the power output of the engines will necessarily change. Therefore, in order not to confuse RPM changes due to changes in power with engine roughness due to excessively lean mixtures, retard the mixture control smoothly enough to permit the propeller governor to maintain constant RPM.) Advance the mixture forward as far as needed to resume smooth engine operation. This will require a very small movement if the leaning-out process has been done carefully.

Since the variation in power during the leaning-out process will result in a change in airspeed, the power settings must be readjusted, as outlined in Section 3, to regain the airspeed desired.

Excessive leaning-out will result in engine speed instability and an unsteady power output. Under most conditions best economy mixtures will be obtained before engine instability is reached. A mixture setting slightly richer than that obtained at the limit of stability is therefore desired.

Appendix II 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.

The fuel flow values appearing on the charts are AUTO LEAN values. Because of the many variables involved it is not possible, with the evidence at hand, to predict what manual leaning flow values would be. The results obtained in one airplane, by one pilot, should not be used for planning purposes for the entire squadron. However, the range (air miles per gallon) of any particular F8F airplane may be increased substantially by manual leaning especially at low gross weights and altitudes.

To obtain maximum air miles per gallon fly at 160 Knots CAS, and manual lean as described above. This airspeed has been calculated to be the optimum for all weights and altitudes in the clean configuration only.

8. CYLINDER HEAD TEMPERATURE LIMITS
(R-2800-34W, -34)

Take-off	AUTO RICH, 5 min.	260°C
Military Power	AUTO RICH, 5 min.	260°C
Normal Rated Power	AUTO RICH, One Hour	260°C
	AUTO LEAN, No Limit	232°C
Maximum Cruise and Lower Power	AUTO LEAN, No Limit	232°C

AUTO RICH must be used for all operation above 2600 RPM, and for take-off, landing, landing approach, for all ground operation, and whenever cylinder head temperatures cannot be maintained within limits in AUTO LEAN.

AUTO LEAN may be used for all flight operation (except take-off, landing and landing approach) at 2600 RPM and below provided cylinder head temperature limits are not exceeded.

9. BLOWER SHIFTING

During these tests no attempt was made to find the optimum blower-shift altitude for powers below Maximum Cruise. All tests were conducted in LOW BLOWER and AUTO LEAN Mixture up to approximately 16000 feet. The data available at present indicate that better fuel economy in HIGH BLOWER would probably be realized at altitudes of approximately 14000 feet and above.

Pending results of flight tests Manual-Leaning must not be attempted in HIGH BLOWER.

(1) To obtain PRESSURE ALTITUDE - Adjust the altimeter setting ("window number") to 29.92. The altitude indicated by the altimeter, after correction for instrument errors, will be pressure altitude. On the Density Altitude Graph Pressure Altitude lines are inclined upward to right; Density Altitude lines are horizontal; Outside Air Temperature lines are vertical.

(2) To determine DENSITY ALTITUDE - Enter Density Altitude Graph with Pressure Altitude and Outside Air Temperature; locate the intersection, and read off Density Altitude.

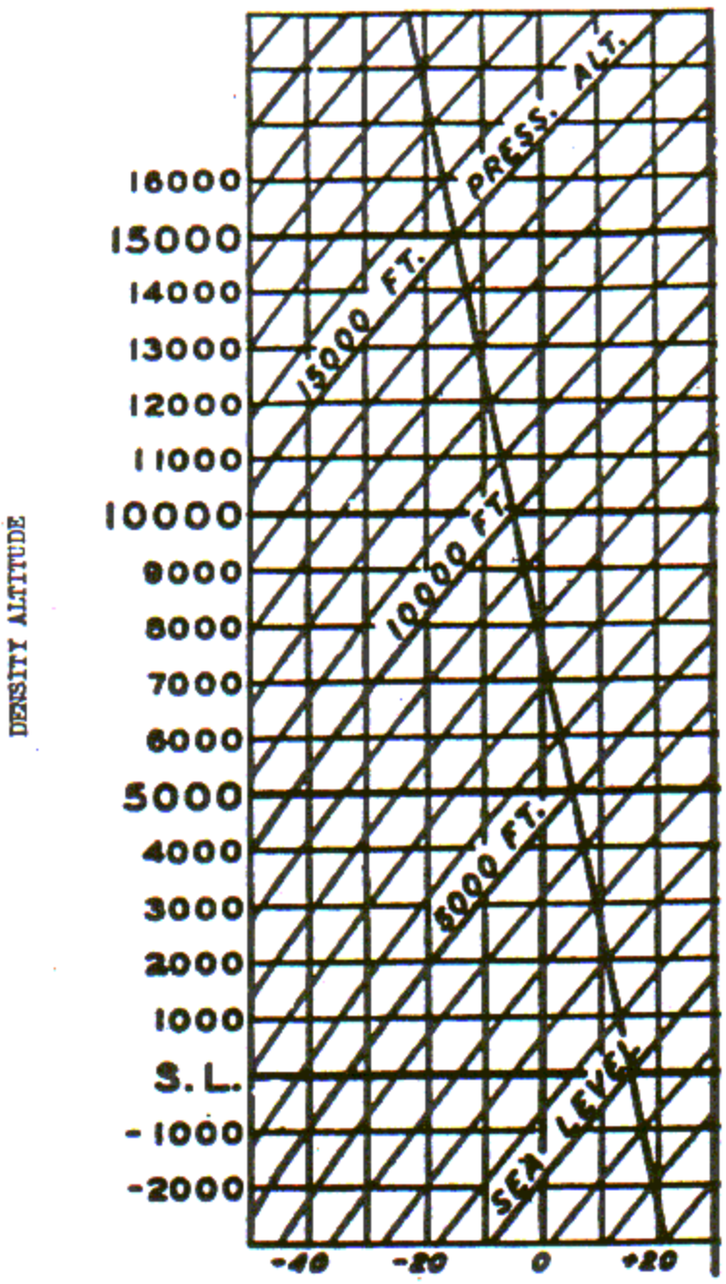
EXAMPLES:

1. Press. Alt. = 6000 ft.
   OAT = 21°C
   Read Dens. Alt. = 8000 ft.

2. Press. Alt. = 9,500 ft.
   OAT = 5°C
   Read Dens. Alt. = 10,500 ft.
   (See Density Altitude Graph, Page 5)

Appendix II 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.

DENSITY ALTITUDE GRAPH



OUTSIDE AIR TEMPERATURE

Appendix II 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.

CONDENSED OPERATING INSTRUCTIONS

F6F

LOW BLOWER AUTO LEAN

CRUISE POWER SETTINGS

DO NOT EXCEED 232°C

HOLD 32 IN. (OR FULL THROTTLE IF 32 IN. CANNOT BE OBTAINED) AND CONTROL AIRSPEED BY ADJUSTING RPM IN THE RANGE 1400 TO 2200 RPM.

IF NECESSARY HOLD 1400 RPM AND REDUCE MP BELOW 32 IN.

1400 RPM - MINIMUM RECOMMENDED

LONG RANGE CRUISE SPEEDS

CLEAN CONFIGURATION - 190 KNOTS CAS.

150-GAL. BELLY TANK - 180 KNOTS CAS.

THE ABOVE CARD MAY BE CARRIED BY THE PILOT OR POSTED IN THE COCKPIT

Appendix II 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.

MAXIMUM CRUISE

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

NO MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	CAS	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	CAS	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH	CAS
16000	-17	2200	F.T.	83	233	2200	F.T.	83	235	2200	F.T.	83	237
14000	-13	2200	F.T.	90	245	2200	F.T.	90	247	2200	F.T.	90	249
12000	- 9	2200	32	91	250	2200	32	91	252	2200	32	91	254
10000	- 5	2200	32	89	252	2200	32	89	254	2200	32	89	256
8000	- 1	2200	32	88	254	2200	32	88	256	2200	32	88	258
6000	3	2200	32	87	255	2200	32	87	257	2200	32	87	259
4000	7	2200	32	85	255	2200	32	85	257	2200	32	85	259
2000	11	2200	32	83	254	2200	32	83	256	2200	32	83	258
S.L.	15	2200	32	80	251	2200	32	80	253	2200	32	80	255

LOW BLOWER
DIRECT AIR
150 GAL. BELLY TANK

AUTO LEAN
COWL FLAPS CLOSED

NO MANUAL LEANING PERMISSIBLE

STD. ALT,	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	CAS	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	CAS	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH	CAS
16000	-17	2200	F.T.	83	222	2200	F.T.	83	224	2200	F.T.	83	226
14000	-13	2200	F.T.	90	233	2200	F.T.	83	235	2200	F.T.	90	237
12000	- 9	2200	32	91	237	2200	32	91	239	2200	32	91	241
10000	- 5	2200	32	89	239	2200	32	89	241	2200	32	89	243
8000	- 1	2200	32	88	241	2200	32	88	243	2200	32	88	245
6000	3	2200	32	87	241	2200	32	87	243	2200	32	87	245
4000	7	2200	32	85	241	2200	32	85	243	2200	32	85	245
2000	11	2200	32	83	241	2200	32	83	243	2200	32	83	245
S.L.	15	2200	32	80	239	2200	32	80	241	2200	32	80	243

ABBREVIATIONS

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.

Appendix II 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.

140 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1400	20.5	44.0	1400	20.0	43.5	1400	18.0	43.0
14000	-13	1400	20.5	43.5	1400	20.0	43.0	1400	18.0	42.5
12000	- 9	1400	20.5	43.0	1400	20.0	42.5	1400	18.5	42.0
10000	- 5	1400	21.0	42.5	1400	20.0	42.0	1400	19.0	41.0
8000	- 1	1400	21.5	41.5	1400	21.0	41.0	1400	20.5	40.5
6000	3	1400	22.0	41.0	1400	21.5	40.0	1400	21.0	39.5
4000	7	1400	23.0	40.0	1400	22.5	39.0	1400	22.0	38.0
2000	11	1400	24.0	38.0	1400	23.5	37.0	1400	23.0	35.5
S.L.	15	1400	25.0	35.0	1400	24.5	34.0	1400	24.0	33.0

LOW BLOWER
DIRECT AIR
150-GAL. BELLY TANK

AUTO LEAN
COWL FLAPS

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1400	21.5	44.5	1400	20.0	44.0	1400	19.5	43.5
14000	-13	1400	21.0	44.0	1400	20.0	43.5	1400	19.5	43.0
12000	- 9	1400	21.0	43.5	1400	20.5	43.0	1400	19.5	42.5
10000	- 5	1400	21.5	43.0	1400	21.0	42.5	1400	20.0	42.0
8000	- 1	1400	22.0	42.0	1400	21.5	41.5	1400	21.0	41.0
6000	3	1400	22.5	41.5	1400	22.0	41.0	1400	21.5	40.5
4000	7	1400	23.5	40.5	1400	23.0	40.0	1400	22.5	39.0
2000	11	1400	24.5	39.5	1400	24.0	38.0	1400	23.5	37.0
S.L.	15	1400	25.0	36.5	1400	24.5	35.0	1400	24	33.5

ABBREVIATIONS:

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.

Appendix II 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.

160 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1480	F.T.	45.0	1400	22.0	44.5	1400	21.0	44.0
14000	-13	1400	22.0	44.5	1400	21.5	44.0	1400	20.5	43.5
12000	- 9	1400	22.0	44.0	1400	21.0	43.5	1400	20.5	43.0
10000	- 5	1400	22.0	43.5	1400	21.5	43.0	1400	21.0	42.5
8000	- 1	1400	22.5	43.0	1400	22.0	42.5	1400	21.5	42.0
6000	3	1400	23.5	42.0	1400	23.0	41.5	1400	22.5	41.0
4000	7	1400	24.0	41.5	1400	23.5	41.0	1400	23.0	40.0
2000	11	1400	25.0	40.5	1400	24.5	39.5	1400	24.0	38.5
S.L.	15	1400	26.0	39.0	1400	25.5	37.0	1400	25.0	35.0

LOW BLOWER
DIRECT AIR
150-GAL BELLY TANK

AUTO LEAN
COWL FLAPS CLOSED

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1540	F.T.	47.0	1480	F.T.	45.0	1430	F.T.	44.5
14000	-13	1425	F.T.	45.0	1400	22.5	44.5	1400	21.5	44.0
12000	- 9	1400	23.0	44.5	1400	22.0	44.0	1400	21.0	43.5
10000	- 5	1400	23.0	44.0	1400	22.0	43.5	1400	21.5	43.0
8000	- 1	1400	23.5	43.5	1400	22.5	43.0	1400	22.0	42.5
6000	3	1400	24.0	43.0	1400	23.5	42.0	1400	23.0	41.5
4000	7	1400	24.5	42.0	1400	24.0	41.5	1400	23.5	41.0
2000	11	1400	25.5	41.5	1400	25.0	40.5	1400	24.5	39.5
S.L.	15	1400	26.5	40.0	1400	26.0	39.0	1400	25.5	37.5

ABBREVIATIONS:

MP - Manifold Pressure
F.T.- Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C

180 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1630	F.T.	50.0	1600	F.T.	48.5	1560	F.T.	47.5
14000	-13	1530	F.T.	48.5	1500	F.T.	47.5	1460	F.T.	46.0
12000	- 9	1420	F.T.	47.0	1400	24.5	46.0	1400	23.5	44.5
10000	- 5	1400	25.0	45.5	1400	24.0	44.5	1400	23.5	44.0
8000	- 1	1400	25.0	44.5	1400	24.0	44.0	1400	23.5	43.5
6000	3	1400	25.5	44.0	1400	25.0	43.5	1400	24.0	43.0
4000	7	1400	26.0	43.5	1400	25.5	43.0	1400	25.0	42.5
2000	11	1400	26.5	42.5	1400	26.0	42.0	1400	25.5	41.5
S.L.	15	1400	27.5	42.0	1400	27.0	41.0	1400	26.5	40.5

LOW BLOWER
DIRECT AIR
150-GAL. BELLY TANK

AUTO LEAN
COWL FLAPS

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1700	F.T.	53.5	1660	F.T.	52.0	1630	F.T.	50.0
14000	-13	1590	F.T.	51.0	1555	F.T.	50.0	1530	F.T.	48.5
12000	- 9	1490	F.T.	49.5	1450	F.T.	48.0	1420	F.T.	47.0
10000	- 5	1400	26.0	48.0	1400	25.5	46.5	1400	25.0	45.0
8000	- 1	1400	26.0	46.5	1400	25.5	45.0	1400	25.0	44.5
6000	3	1400	26.0	45.0	1400	25.5	44.5	1400	25.0	44.0
4000	7	1400	26.5	44.0	1400	26.0	43.5	1400	25.5	43.0
2000	11	1400	27.5	43.5	1400	27.0	43.0	1400	26.5	42.5
S.L.	15	1400	28.5	43.0	1400	28.0	42.0	1400	27.5	41.0

ABBREVIATIONS:

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.

Appendix II 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.

190 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1730	F.T.	54.5	1680	F.T.	52.5	1650	F.T.	51.5
14000	-13	1620	F.T.	52.5	1580	F.T.	51.0	1550	F.T.	49.5
12000	- 9	1520	F.T.	50.5	1480	F.T.	49.0	1450	F.T.	47.5
10000	- 5	1400	27.0	49.0	1400	26.0	47.5	1400	25.5	46.5
8000	- 1	1400	26.5	47.5	1400	26.0	46.0	1400	25.5	45.0
6000	3	1400	26.5	46.0	1400	26.0	44.5	1400	25.5	44.0
4000	7	1400	27.0	44.5	1400	26.5	44.0	1400	26.0	43.5
2000	11	1400	28.0	44.0	1400	27.5	43.5	1400	27.0	43.0
S.L.	15	1400	28.5	43.0	1400	28.0	42.5	1400	27.5	42.0

ABBREVIATIONS:

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.

200 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1820	F.T.	59.5	1780	F.T.	57.5	1760	F.T.	56.5
14000	-13	1700	F.T.	57.5	1670	F.T.	56.0	1650	F.T.	54.0
12000	- 9	1600	F.T.	55.0	1570	F.T.	53.5	1550	F.T.	52.5
10000	- 5	1500	F.T.	53.5	1470	F.T.	52.0	1440	F.T.	50.0
8000	- 1	1400	28.5	51.5	1400	28.0	50.0	1400	27.5	49.0
6000	3	1400	28.5	50.0	1400	28.0	48.5	1400	27.5	47.5
4000	7	1400	28.5	48.0	1400	28.0	47.0	1400	27.5	45.5
2000	11	1400	29.0	46.5	1400	28.5	45.0	1400	28.0	44.5
S.L.	15	1400	30.0	45.0	1400	29.5	44.0	1400	29.0	43.5

MANUAL LEANING PERMISSIBLE

LOW BLOWER
DIRECT AIR
150-GAL. BELLY TANK

AUTO LEAN
COWL FLAPS CLOSED

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	1920	F.T.	64.5	1900	F.T.	63	1870	F.T.	62.0
14000	-13	1780	F.T.	62.0	1760	F.T.	61	1750	F.T.	60.0
12000	- 9	1670	F.T.	60.0	1650	F.T.	58.5	1640	F.T.	57.5
10000	- 5	1580	F.T.	57.5	1550	F.T.	56.5	1540	F.T.	55.5
8000	- 1	1480	F.T.	56.0	1450	F.T.	55.0	1430	F.T.	54.0
6000	3	1400	30.5	54.0	1400	30.0	53.0	1400	29.5	52.0
4000	7	1400	30.5	52.5	1400	30.0	51.5	1400	29.5	50.0
2000	11	1400	30.5	50.5	1400	30.0	49.5	1400	29.5	48.5
S.L.	15	1400	31.5	49.0	1400	31.0	48.0	1400	30.5	47.0

MANUAL LEANING PERMISSIBLE

ABBREVIATIONS:

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.

Appendix II 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.

220 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	2050	F.T.	72.5	2000	F.T.	69.0	2000	F.T.	69.0
14000	-13	1920	F.T.	69.5	1900	F.T.	68.0	1870	F.T.	67.0
12000	- 9	1790	F.T.	67.0	1770	F.T.	65.0	1750	F.T.	64.0
10000	- 5	1680	F.T.	64.5	1660	F.T.	63.0	1650	F.T.	62.0
8000	- 1	1580	F.T.	62.5	1560	F.T.	61.0	1550	F.T.	60.0
6000	3	1500	32.0	60.5	1470	32.0	59.5	1450	F.T.	58.0
4000	7	1480	32.0	58.5	1450	32.0	57.5	1410	32.0	56.5
2000	11	1490	32.0	57.5	1450	32.0	56.0	1420	32.0	55.0
S.L.	15	1540	32.0	55.5	1500	32.0	54.5	1470	32.0	53.0

MANUAL LEANING PERMISSIBLE

LOW BLOWER ONLY
DIRECT AIR
150-GAL. BELLY TANK

AUTO LEAN
COWL FLAPS CLOSED

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	2180	F.T.	81.0	2150	F.T.	79.0	2130	F.T.	77.5
14000	-13	2040	F.T.	77.5	2020	F.T.	76.0	2000	F.T.	74.5
12000	- 9	1920	F.T.	74.0	1900	F.T.	73.0	1870	F.T.	71.5
10000	- 5	1800	F.T.	71.5	1780	F.T.	70.0	1760	F.T.	69.0
8000	- 1	1700	32.0	69.5	1680	32.0	68.0	1650	F.T.	67.0
6000	3	1680	32.0	67.5	1650	32.0	66.5	1610	32.0	65.0
4000	7	1670	32.0	66.0	1640	32.0	64.5	1600	32.0	63.0
2000	11	1690	32.0	64.5	1660	32.0	63.0	1620	32.0	62.0
S.L.	15	1750	32.0	63.0	1700	32.0	62.0	1670	32.0	60.5

MANUAL LEANING PERMISSIBLE

ABBREVIATIONS:

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.

Appendix II

240 KNOTS CAS

LOW BLOWER
DIRECT AIR
CLEAN CONFIGURATION

AUTO LEAN
COWL FLAPS CLOSED

NO MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C.	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	-	-	-	-	-	-	-	-	-
14000	-13	2150	F.T.	85.0	2130	F.T.	83.0	2100	F.T.	81.5
12000	- 9	2030	F.T.	80.5	2000	F.T.	79.0	1980	F.T.	77.5
10000	- 5	1920	32.0	77.5	1880	32.0	76.0	1860	F.T.	75.0
8000	- 1	1890	32.0	76.0	1830	32.0	74.5	1800	32.0	73.0
6000	3	1870	32.0	74.5	1820	32.0	72.5	1780	32.0	71.5
4000	7	1690	32.0	73.0	1830	32.0	71.5	1790	32.0	70.0
2000	11	1920	32.0	71.5	1870	32.0	70.0	1830	32.0	68.5
S.L.	15	1950	32.0	70.0	1910	32.0	68.5	1880	32.0	67.5

LOW BLOWER
DIRECT AIR
150-GAL. BELLY TANK

AUTO LEAN
COWL FLAPS CLOSED

NO MANUAL LEANING PERMISSIBLE

STD. ALT.	STD. TEMP. °C	GROSS WEIGHT 10,000 LBS. RPM	MP	GPH	GROSS WEIGHT 9,500 LBS. RPM	MP	GPH	GROSS WEIGHT 9,000 LBS. RPM	MP	GPH
16000	-17	-	-	-	-	-	-	-	-	-
14000	-13	-	-	-	-	-	-	-	-	-
12000	- 9	-	-	-	2200	32.0	91.0	2160	32.0	88.5
10000	- 5	2200	32.0	89.0	2160	32.0	87.5	2110	32.0	85.0
8000	- 1	2180	32.0	87.0	2130	32.0	84.5	2080	32.0	82.5
6000	3	2160	32.0	85.0	2100	32.0	82.5	2070	32.0	81.0
4000	7	2150	32.0	83.5	2110	32.0	81.5	2080	32.0	80.0
2000	11	2180	32.0	82.5	2130	32.0	80.0	2100	32.0	78.5
S.L.	15	-	-	-	2180	32.0	79.5	2140	32.0	77.5

ABBREVIATIONS:

MP - Manifold Pressure
FT - Full Throttle
CAS - Calibrated Airspeed, Knots
GPH - Gallons Per Hour
OAT - Outside Air Temperature, °C.