AN 01-60FE-1

HANDBOOK

FLIGHT OPERATING INSTRUCTIONS

USAF SERIES **T-6C**

NAVY MODEL **SNJ-4**

AIRCRAFT

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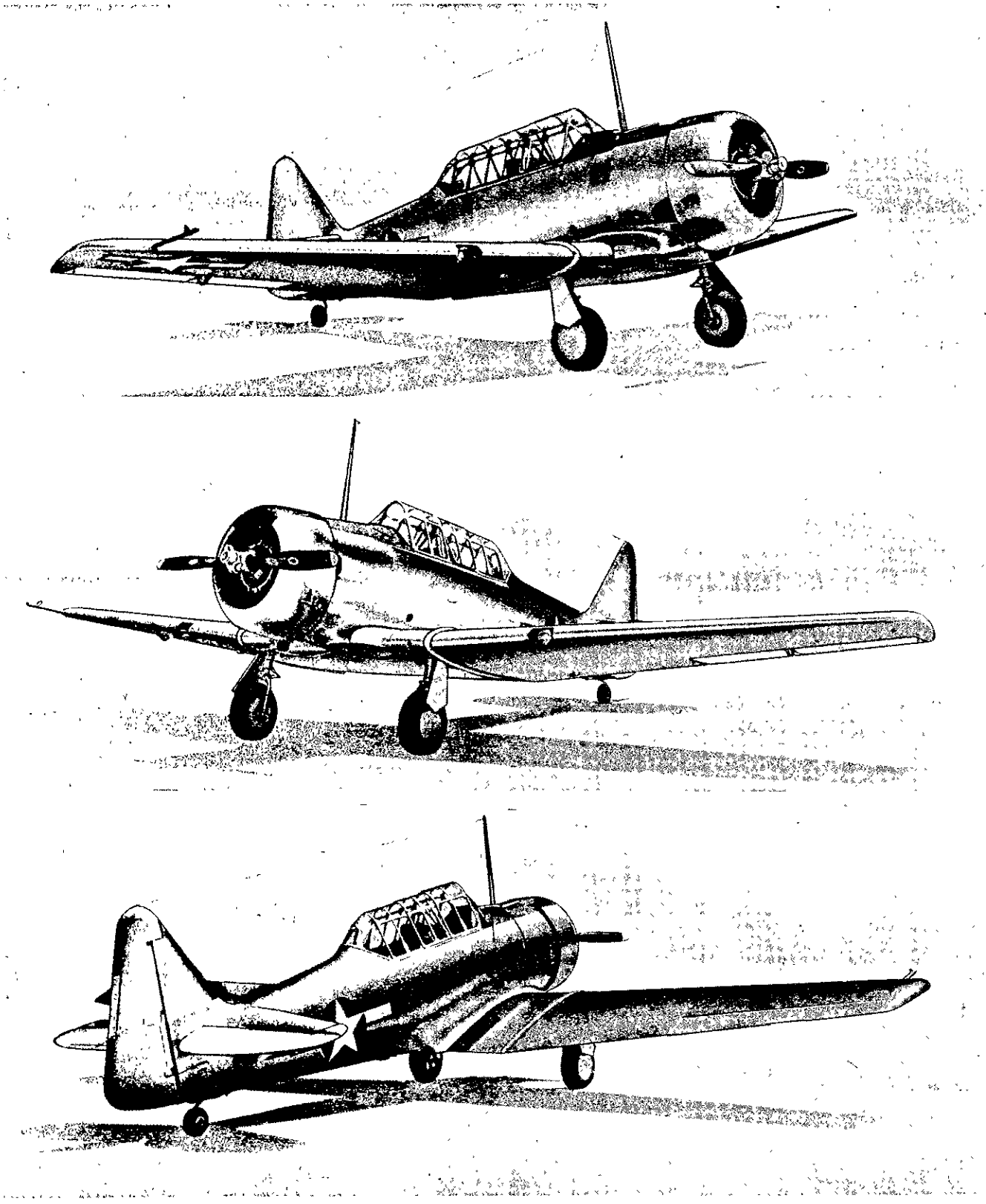
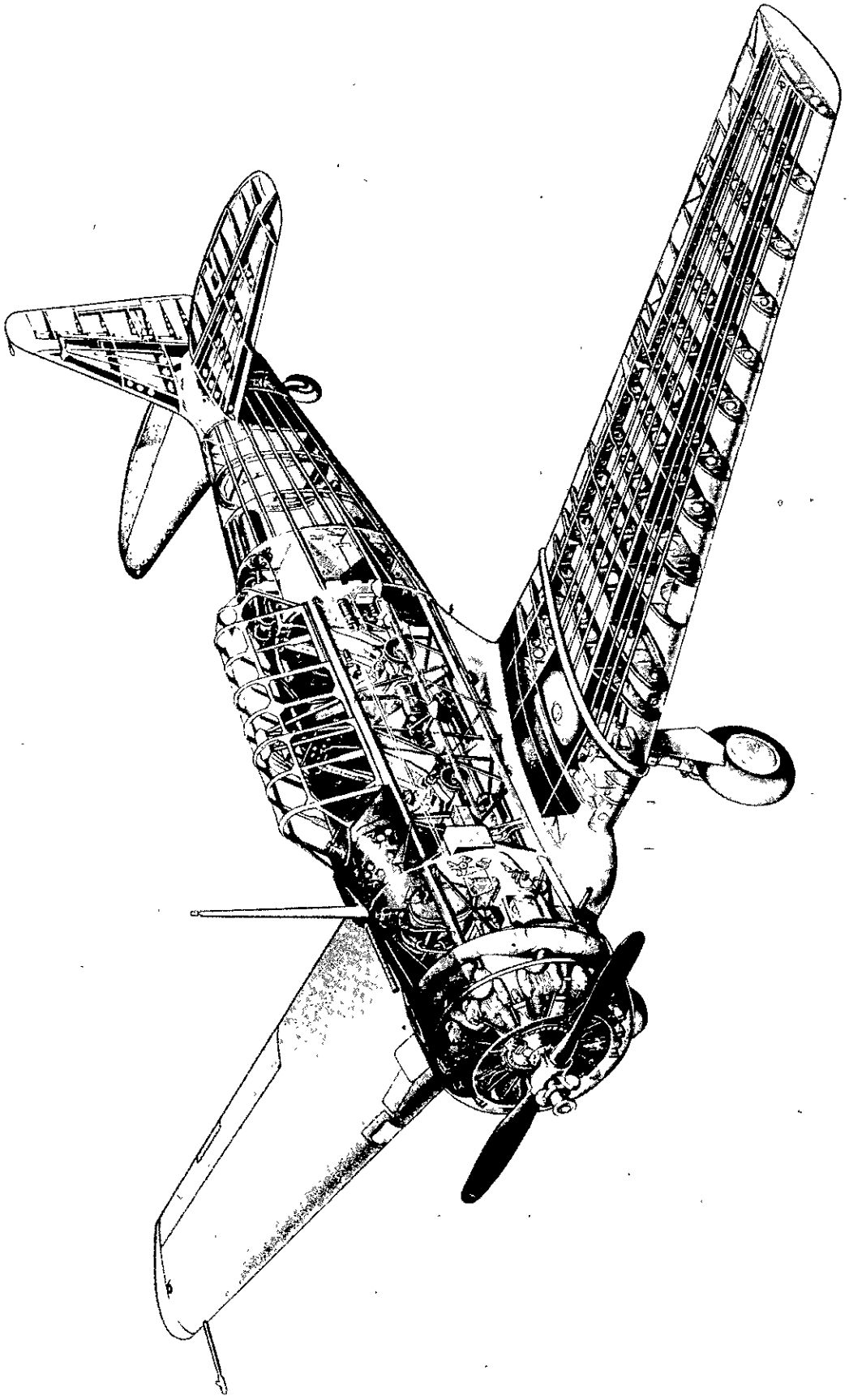


Three Views of AT-6C



Phantom View

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SECTION I
DESCRIPTION

1. GENERAL.

AT-6C and SNJ-4 (Navy) airplanes are two-place, dual controlled, single-engine, low-wing monoplanes designed as advanced trainers with provisions for the installation of bomb carrying and gunnery equipment. The front fuselage section houses the front and rear cockpits and all the controls and equipment for operating the airplane. The baggage compartment and lift and mooring tube are contained in the rear fuselage section. The airplane has a wing span of 42 feet, 1/4 inch; a length of 28 feet, 11-7/8 inches; a height (tail up) of 12 feet, 9-1/4 inches; and weighs (normal gross) 5300 pounds.

2. DESCRIPTION OF CHANGES.

A major production change in movement of control surfaces to improve the spin characteristics of the airplane divides them into two basic groups as listed below.

The airplane can be identified by movement of the aileron tabs. Booster tabs on Group I airplanes will move in opposite relation to the aileron while trim tabs on Group II airplanes are fixed. For effectiveness of these changes, refer to section II, paragraph 13.

	Group I Airplanes	Group II Airplanes
Rudder travel (from airplane center line)	35 degrees	30 degrees
Aileron Travel		
Up	30 degrees	15 degrees
Down	15 degrees	15 degrees
Aileron tabs	Booster	Trim
Tail wheel travel (from airplane center line)	30 degrees	*15 degrees

*Tail wheel—rudder travel ratio, 2:1.

Note

On Group II airplanes the rudder pedal neutral position is moved aft one inch to provide full rudder throw by pilots of very short stature.

3. FLIGHT CONTROLS.

The ailerons, elevators, and rudder are conventionally operated from either cockpit by a control stick and rudder pedals. A flap control handle is mounted on the control shelf at the left side of each cockpit. A surface control locking mechanism is left and forward of the front cockpit control stick base. The controls are locked in this manner: neutralize the rudder pedals, push the control stick forward of center, pull up and aft on the lock handle, engage the control stick in the lock recess, and engage the lock plunger. To release, push the lock control handle forward and down. Aileron trim or booster tab adjustments are made at the tab only; rudder and elevator trim tabs are adjusted by control wheels on the left side of each cockpit. Elevator trim wheel is marked "NEUTRAL", "TH", and "NH"; rudder trim wheel is marked "NEUTRAL", "L", and "R". The rear cockpit control stick, when not in use, is stowed in a socket at the left side of the cockpit.

4. LANDING GEAR.

a. CONTROL. *(See figures 5 and 8.)*—A control lever for the hydraulically operated main landing gear is mounted on the control shelf at the left side of each cockpit. The front cockpit control has three positions, "UP", "DOWN", and "EMERGENCY" (used to manually lock the gear in the down position). This control will extend or retract the gear. Controls must remain in their "UP" or "DOWN" positions when the gear is operated as there is no neutral position. The control in the rear cockpit will only extend the gear. The nonretractable tail wheel is steered by the rudder pedals within a 15 degree arc (30 degrees on Group I airplanes) in either direction and becomes free-swiveling beyond that point. The tail wheel may be locked in a steerable position for take-off and landing and unlocked to a full swivel position for parking and towing by means of a control located on the left side of the front cockpit above and aft of the flap control.

b. POSITION INDICATOR. *(See figure 5.)*—Mechanical position indicators on the forward end of the control shelf in the front cockpit indicate the travel and position of the main landing gear at all times.

c. WARNING HORN.—A warning horn is mounted in the overturn structure above the rear instrument panel. If the landing gear is not locked in the down position when the throttle is retarded for landing, the horn will vibrate.

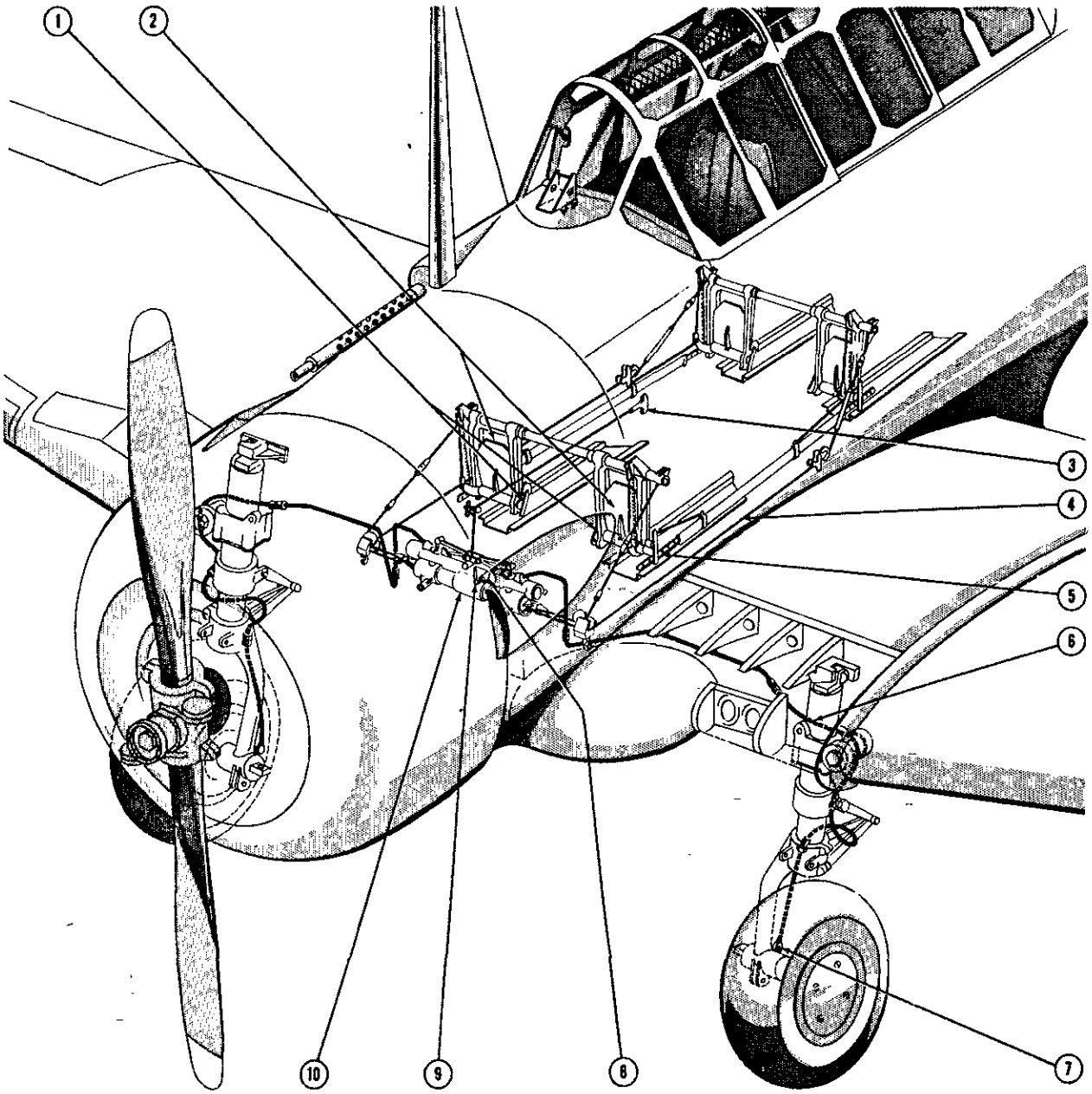
CAUTION

Do not operate the landing gear control when airplane is on the ground, as there is no safety provision to prevent the gear from retracting.

5. BRAKES.

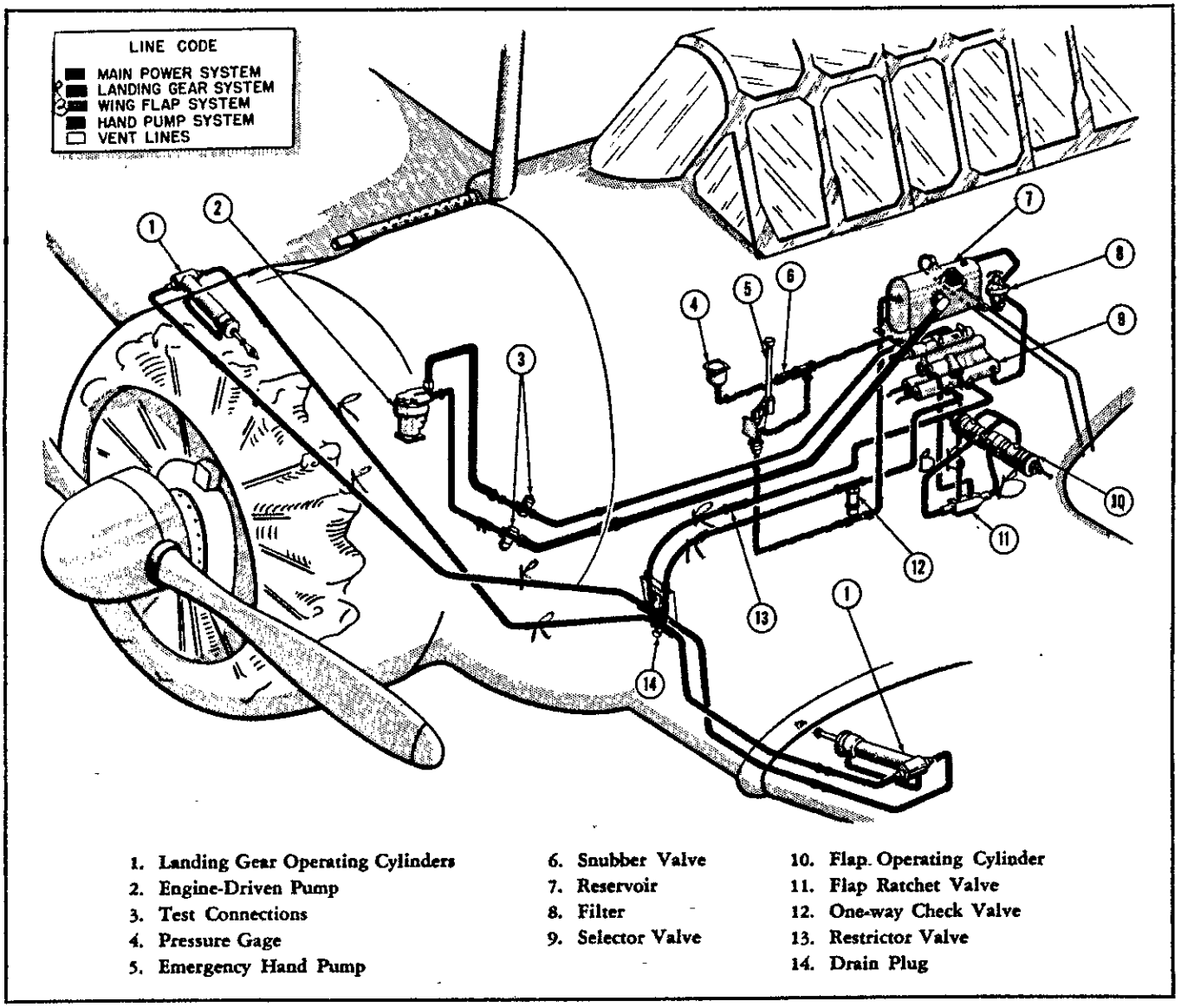
(See figure 1.)

A separate hydraulic system is employed for operating the brakes which are of the reversible, Hayes internal expanding type. Brake pedals are incorporated in the rudder pedal assemblies of both cockpits. A handle for setting the parking brakes is located just below the electrical control panel in the front cockpit only; however they may be released from either cockpit by depressing the pedals. The parking brakes are set by depressing the brake pedals, pulling out the handle, releasing the pedals, and then releasing the handle.



1. Pedal Adjustment Lever
2. Rudder Pedal
3. Parking Brake Handle
4. Brake Cables
5. Pedal Adjustment Linkage
6. Brake Lines
7. Bleeder Valve
8. Filler Neck
9. Vent Line
10. Master Brake Cylinder

Figure 1 — Brake Hydraulic System



1. Landing Gear Operating Cylinders
2. Engine-Driven Pump
3. Test Connections
4. Pressure Gage
5. Emergency Hand Pump
6. Snubber Valve
7. Reservoir
8. Filter
9. Selector Valve
10. Flap Operating Cylinder
11. Flap Ratchet Valve
12. One-way Check Valve
13. Restrictor Valve
14. Drain Plug

Figure 2 — Main Hydraulic System

6. MAIN HYDRAULIC SYSTEM.

(See figure 2.)

The main hydraulic system is provided to operate the main landing gear and wing flaps. Pressure is controlled by a power control lever on the control shelf of each cockpit; when pressed, hydraulic power is available for approximately two minutes before the control automatically disengages. Operation of the flaps and landing gear is controlled by individual levers on the control shelf of each cockpit. The flap control has three positions, "UP", "LOCKED", and "DOWN". The "LOCKED" position is used to lock the flaps in any intermediate position. It is necessary to leave the control in the "UP" or "DOWN" position when full retraction or extension is desired as there is no neutral position. An emergency hand pump, located just left of the pilot's seat in the front cockpit, is provided for emergency operation of the flaps and landing gear. A pressure gage on the forward end of the front cockpit control shelf indicates the pressure in the main hydraulic system when the power control lever is engaged.

7. POWER PLANT.

a. ENGINE.—The airplane is powered by a Pratt and Whitney R-1340-AN-1, nine-cylinder, air-cooled, radial engine equipped with a Hamilton Standard constant-speed propeller and an up-draft type carburetor containing an idle cut-off. A quadrant on the left side of each cockpit contains the throttle, mixture, and propeller control levers. Creepage of the controls is prevented by a disc-type friction clutch at the bottom of the front cockpit quadrant only.

b. FUEL AND OIL.

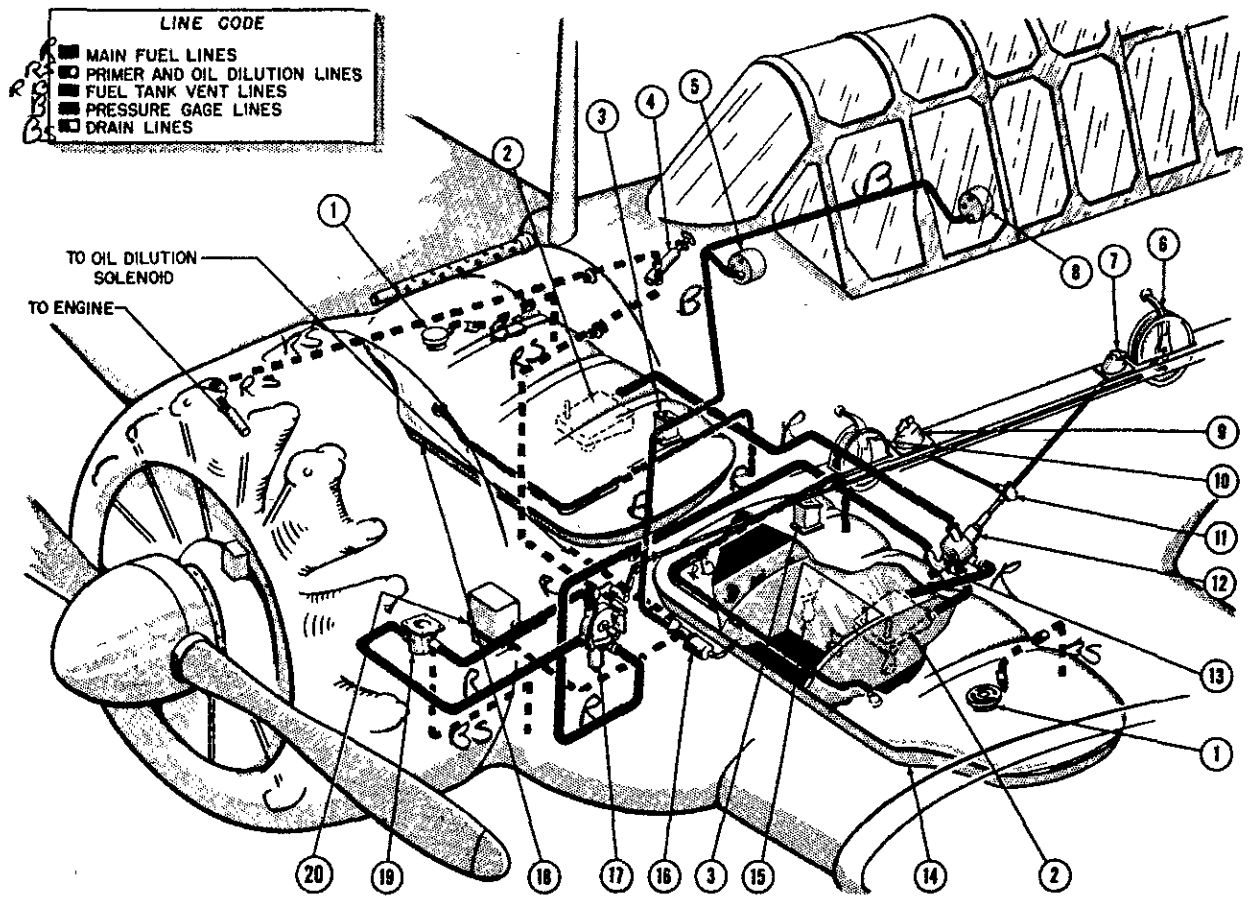
Fuel: Specification No. AN-F-48, grade 91/98
Oil: Specification No. AN-O-8, grade 1120 (S) and 1100 (W)

c. THROTTLE CONTROL.—The throttle controls on the two quadrants are linked by rods; the forward position is "OPEN", the aft position "CLOSED". A toggle-type stop on the front quadrant restricts movement of the controls so that 36 in. Hg is not exceeded at sea level take-off. The stop may be released only on the front quadrant for further throttle advancement in case of emergency.

d. MIXTURE CONTROL.—The mixture control on the throttle quadrant in each cockpit enables the pilot to control the fuel-air mixture to the engine to obtain low fuel consumption. Positions on the quadrant are: forward, "RICH"; and aft, "IDLE CUT-OFF." Any position between "RICH" and "IDLE CUT-OFF" is in the manual leaning range. The front cockpit mixture control is equipped with a spring-loaded lock and rachet. When the mixture control in either cockpit is moved forward, the lock is automatically released; however, before the mixture controls can be moved back toward the "IDLE CUT-OFF" position, it is necessary to press forward on the lock lever on the front mixture control. The idle cut-off becomes effective when the controls are in the "IDLE CUT-OFF" position and shuts off fuel flow at the carburetor to stop the engine.

e. PROPELLER CONTROL. — The positions of the propeller controls are: forward, "INCREASE RPM"; aft, "DECREASE RPM". Movement of the controls operates valves in the propeller governor which controls the blade angle of the propeller. Blade angles of the propeller are from 11-½ degrees in the low pitch position to 27 degrees in high pitch.

f. CARBURETOR AIR CONTROL. *(See figure 5.)*— The carburetor air temperature control quadrant is lo-



1. Filler Caps
2. Fuel Tank Sumps
3. Fuel Tank Gage Assemblies
4. Primer
5. Front Cockpit Engine Gage
6. Rear Fuel Pump Handle
7. Rear Fuel Selector Dial
8. Rear Cockpit Engine Gage
9. Front Fuel Selector Dial
10. Front Fuel Pump Handle
11. Selector Valve Gear
12. Fuel Selector Valve
13. Selector Valve Drain Cock
14. Left Fuel Tank
15. Flapper Valve
16. Fuel Pressure Signal
17. Fuel Unit
18. Right Fuel Tank
19. Engine-Driven Pump
20. Carburetor

Figure 3 — Fuel System

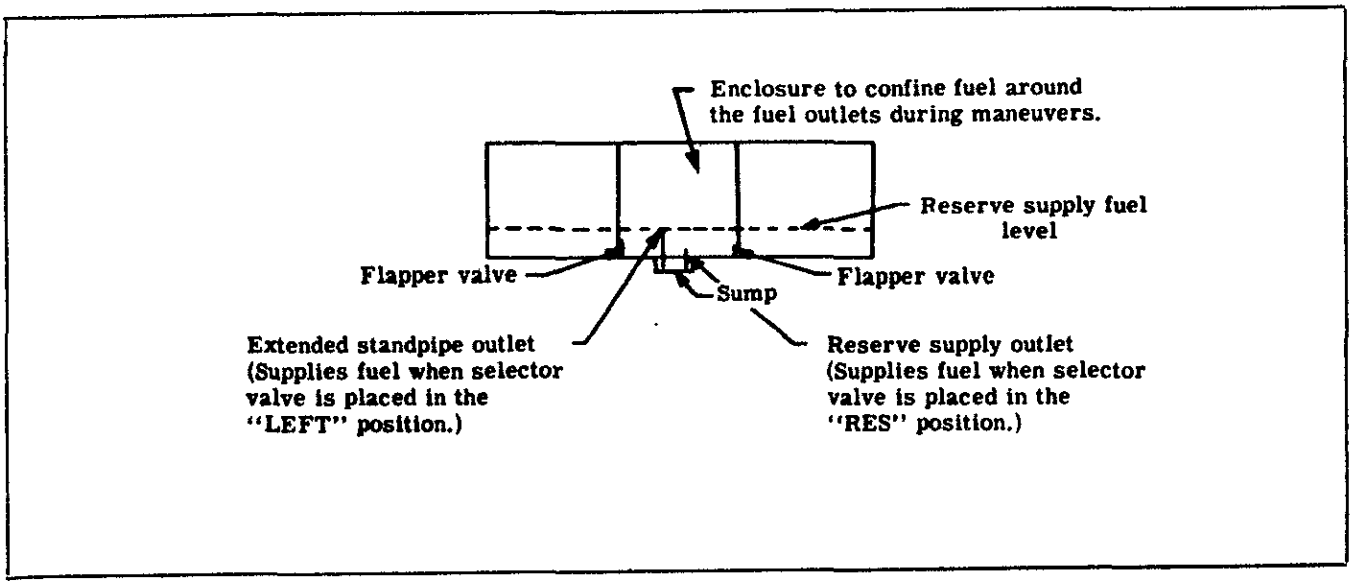


Figure 3A—Fuel Tank Detail

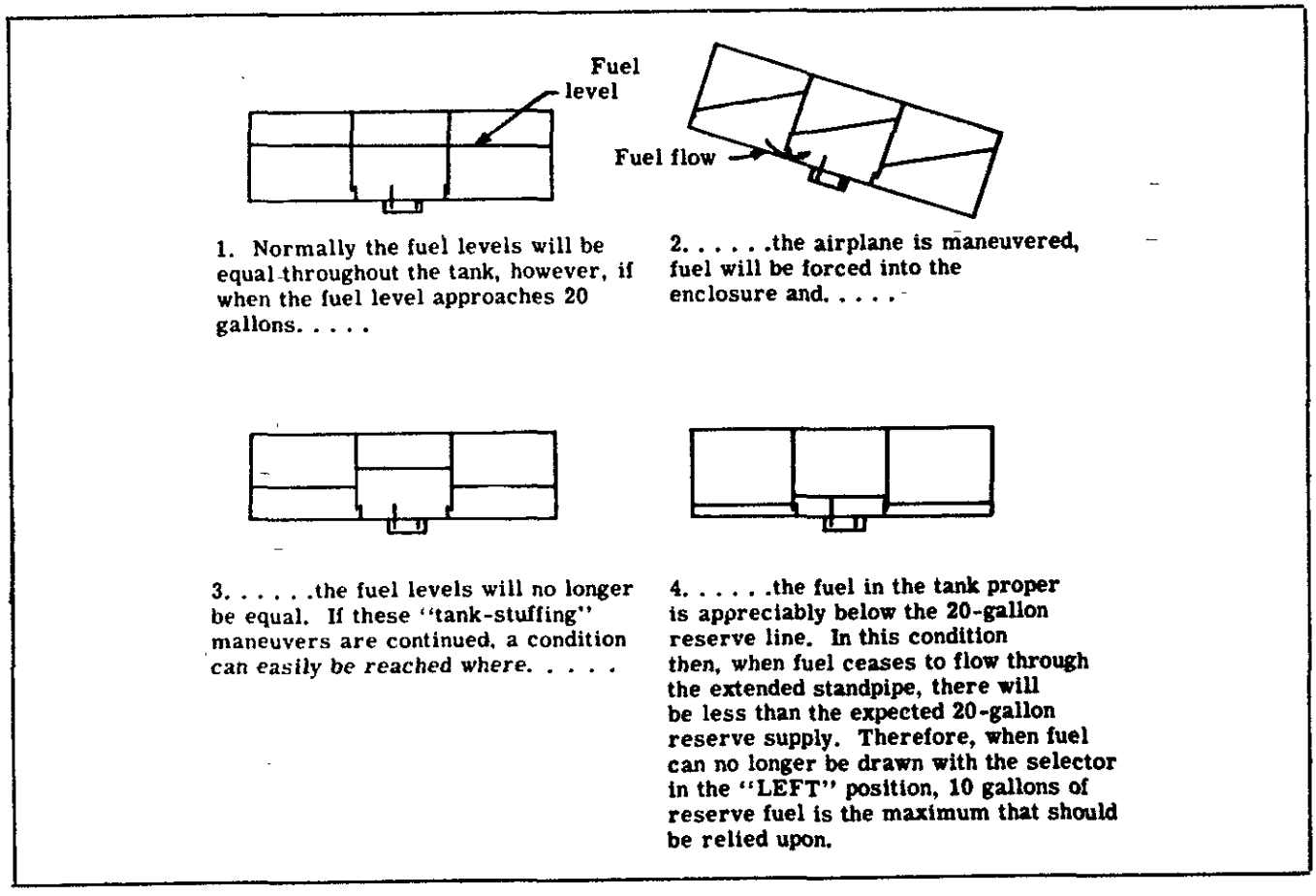


Figure 3B—Decreased Reserve Fuel

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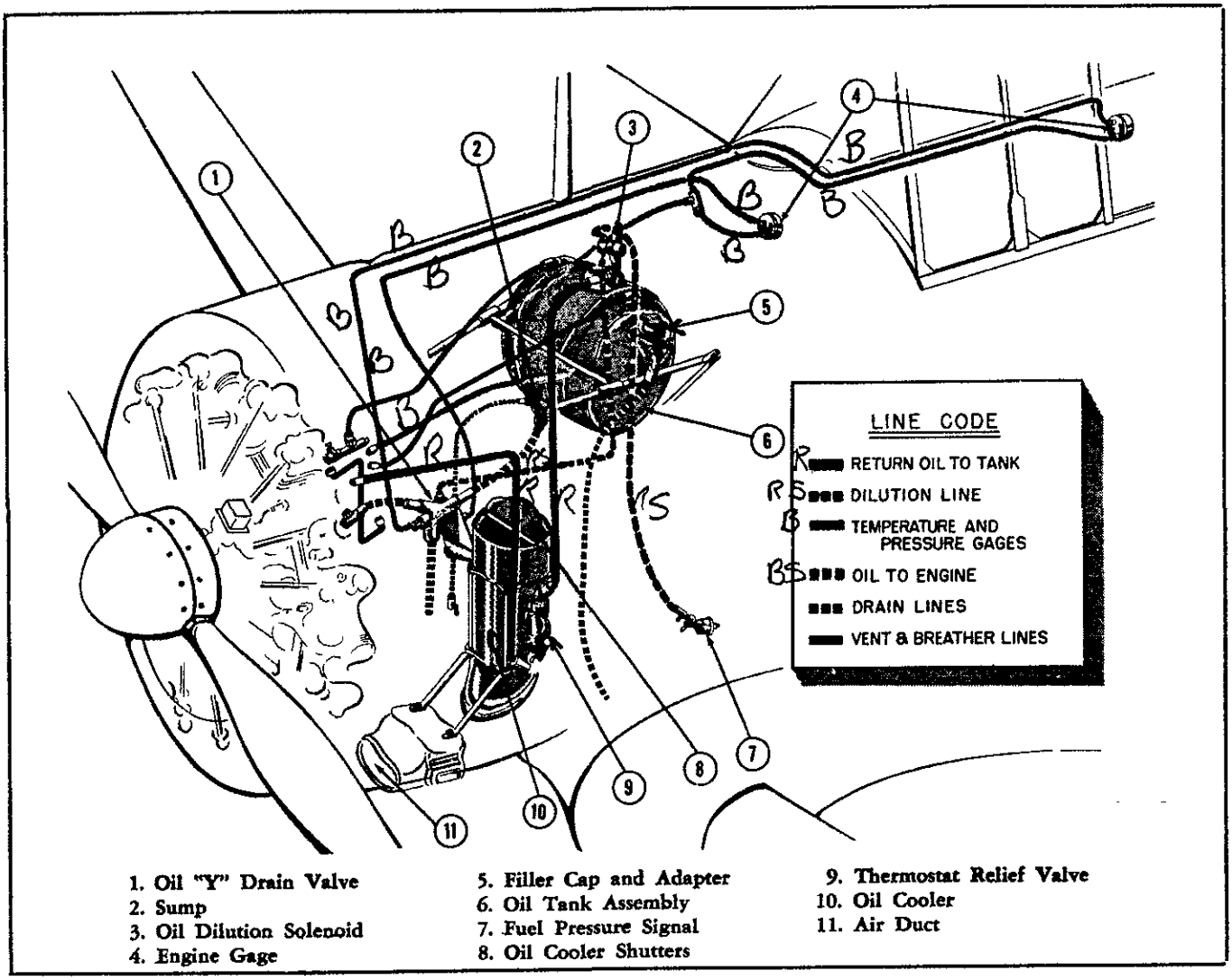


1. Oil "Y" Drain Valve
2. Sump
3. Oil Dilution Solenoid
4. Engine Gage
5. Filler Cap and Adapter
6. Oil Tank Assembly
7. Fuel Pressure Signal
8. Oil Cooler Shutters
9. Thermostat Relief Valve
10. Oil Cooler
11. Air Duct

Figure 4—Oil System

cated at the left side of the front cockpit. When the control is in the "COLD" position, the gate in the carburetor air duct is open to permit cold air entrance; when it is in the "HOT" position, the gate is closed and hot air enters from the exhaust manifold shroud.

g. STARTER CONTROL. *(See figure 13.)*—A foot pedal for electrical control of the starter is mounted between the rudder pedals in the front cockpit. Pressure on the pedal energizes and engages the starter with the engine.

h. MANIFOLD PRESSURE GAGE DRAIN. *(See figure 5.)*—A manifold pressure gage drain is located on the left side of the front cockpit. This drain should be operated for 5 seconds at engine warm-up in order to expel moisture from the line.

i. ENGINE PRIMER. *(See figure 7.)*—The manually operated primer pump is installed directly below the front cockpit instrument panel. Pushed in and turned to the right, the handle is in the "OFF", locked position. To unlock, push the handle in and turn to the left.

8. FUEL SYSTEM.

(See figures 3, 3A, and 3B.)

a. GENERAL.—The fuel system incorporates two 55 gallon fuel tanks which are located in the center section of the wing. An engine driven fuel pump supplies fuel under pressure to the carburetor. In the event of failure of the engine-driven fuel pump, fuel can be supplied to the carburetor by means of a hand pump.

(1) RESERVE FUEL.—To provide 20 gallons of reserve fuel in the left tank, a fuel outlet with an extended stand pipe is employed. *(See figure 3A.)* This stand pipe will not supply fuel from below the level of its inlet, thus creating an unavailable supply of fuel unless the fuel selector valve is positioned properly. A separate fuel outlet is used to supply this reserve fuel. Although the system is designed to maintain a 20 gallon reserve, not more than 10 gallons can be relied on. *(See figure 3B.)*

(2) FUEL OUTLET ENCLOSURE.—To minimize the possibility of exposure of the fuel outlets during maneuvers, an enclosure is provided to confine the fuel around the fuel outlets. The fuel enters this enclosure by means of flapper valves which allow fuel to enter but not escape.

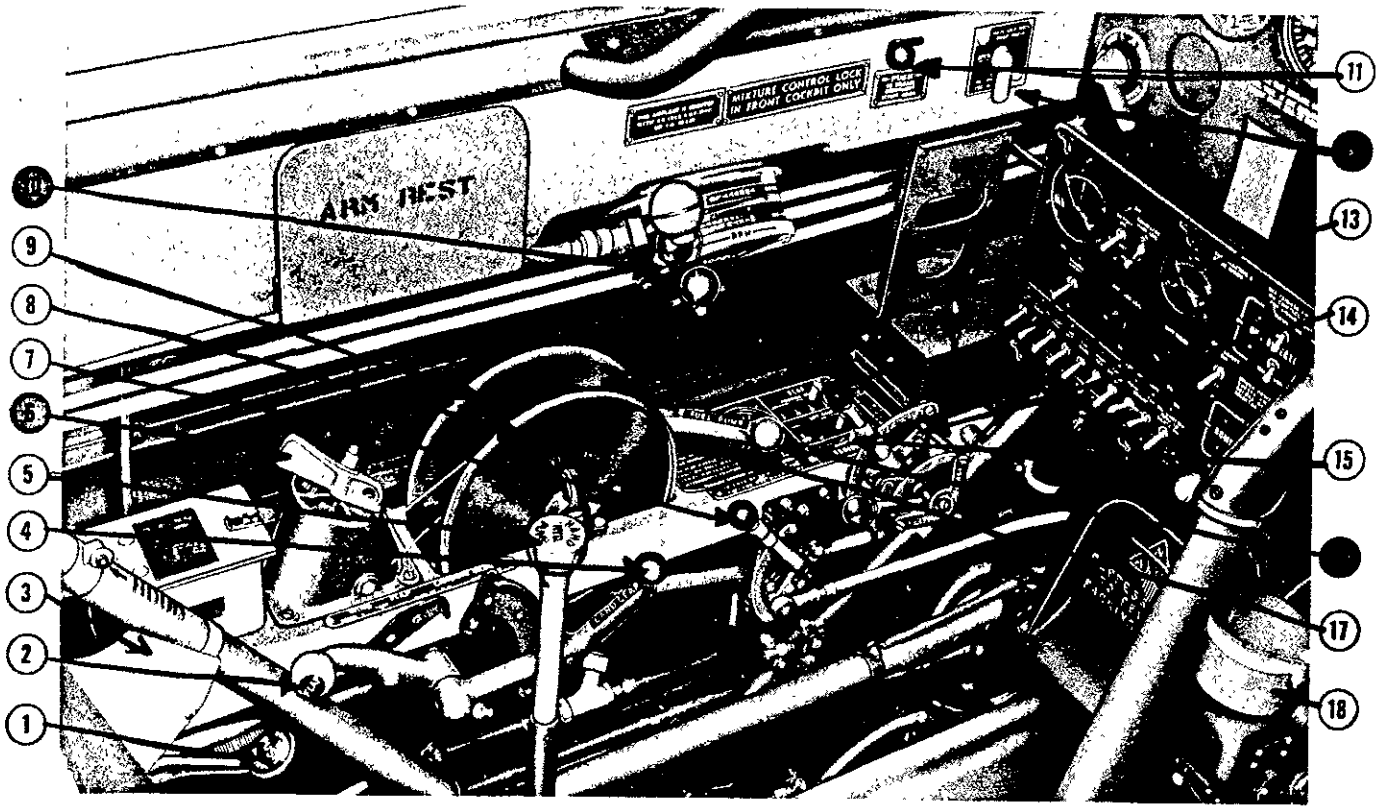


Figure 5 — Left Side Front Cockpit

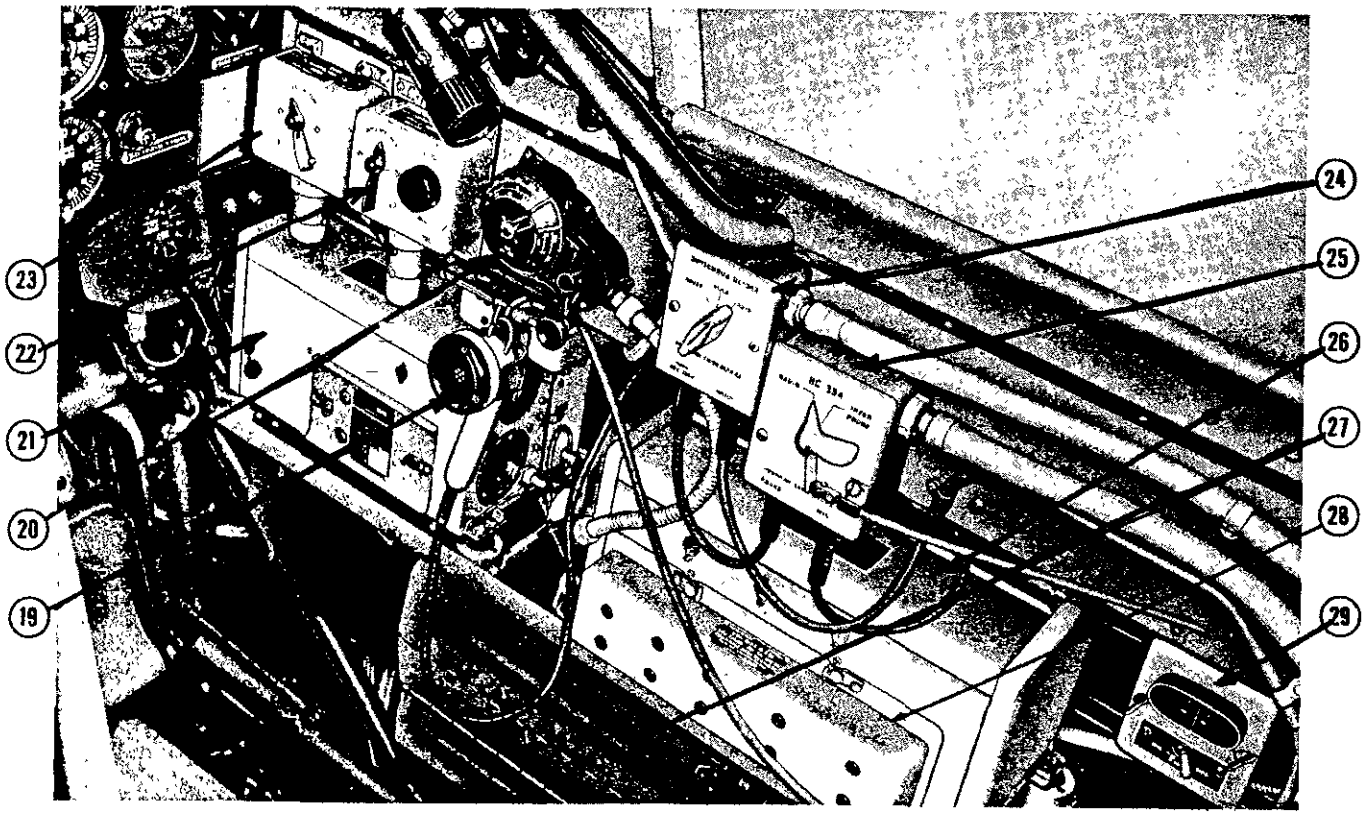
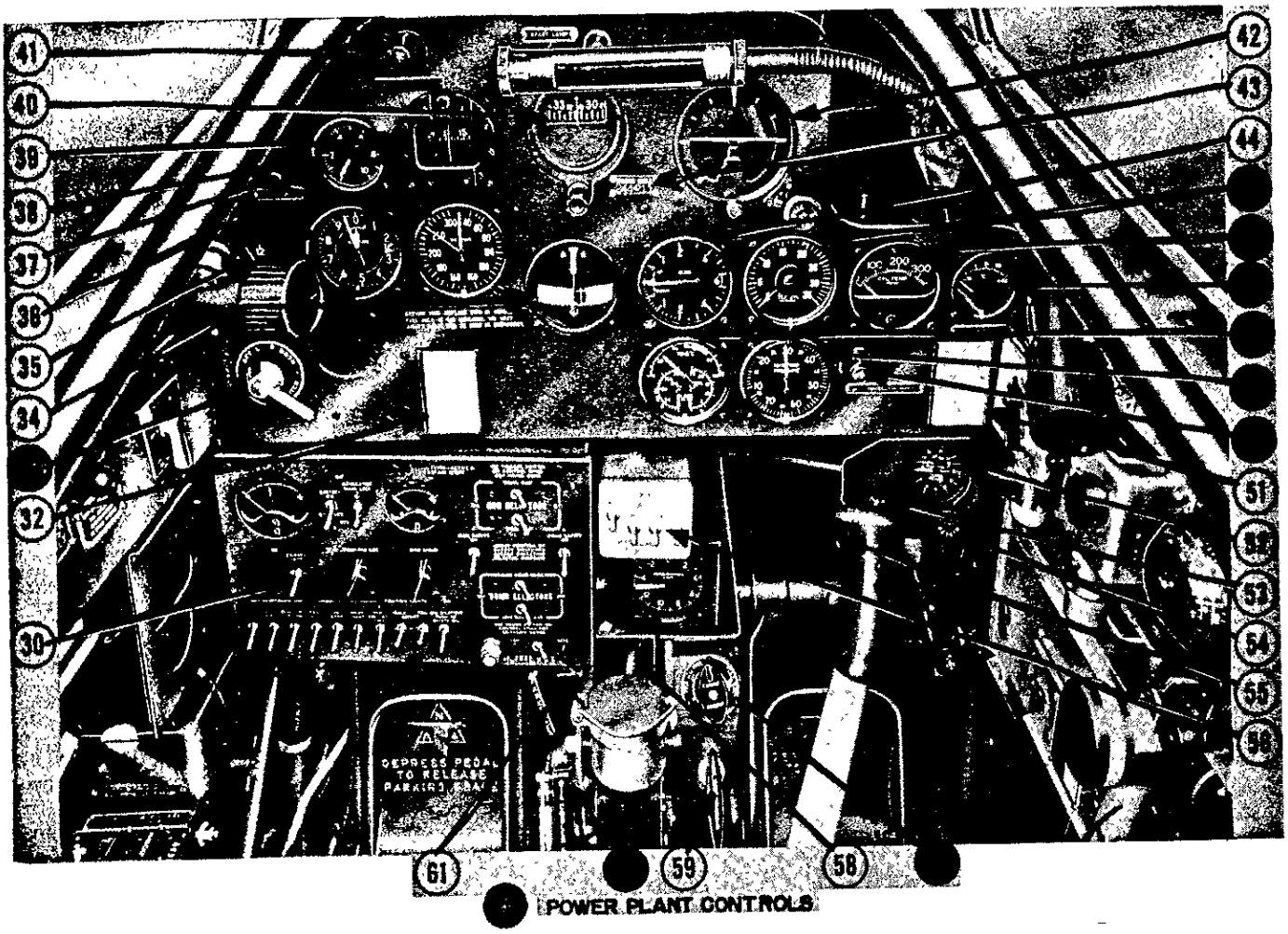


Figure 6 — Right Side Front Cockpit



1. Hydraulic Power Control
2. Flap Control
3. Flight Report Case
4. Landing Gear Control
5. Hydraulic Hand Pump
6. Fuel Selector
7. Carburetor Air Temp Control
8. Elevator Trim Tab Control
9. Rudder Trim Tab Control
10. Engine Control Quadrant
11. Blind Flying Hood Release
12. Manifold Pressure Gage Drain Valve
13. Flap Position Indicator
14. Bomb Control Quadrant
15. Landing Gear Position Indicator
16. Hand Fuel Pump Handle
17. Hydraulic Pressure Gage
18. Gun Sight
19. Microphone
20. Receiver Tuning Dial
21. Radio Transmitter
22. Radio Receiver Switch
23. Transmitter Modulator Switch
24. Radio Filter Box
25. Radio-Interphone Selector Switch
26. Radio Receiver
27. Map and Data Case
28. Receiver Coil Unit
29. British Interphone Switch
30. Electrical Control Panel
31. Deleted
32. Altimeter Correction Chart
33. Ignition Switch
34. Bank and Turn Indicator
35. Clock
36. Altimeter
37. Air-Speed Indicator
38. Suction Gage
39. Magnetic Compass
40. Directional Gyro
41. Camera Signal Light
42. Gyro Horizon
43. Radio Call Plate
44. Rate of Climb Indicator
45. Tachometer
46. Cylinder Head Temp Gage
47. Carburetor Mixture Temp Gage
48. Oil Temp, Fuel and Oil Pressure Gage
49. Manifold Pressure Gage
50. Fuel Switch-over Signal Light
51. Compass Correction Chart
52. Oxygen Pressure and Flow Gage
53. Bomb Release Switch
54. Oxygen Regulator Control
55. Gun Trigger Switch
56. Recognition Light Switches
57. Engine Primer
58. Accelerometer
59. Gun Charger
60. Oil Cooler Shutter Control
61. Parking Brake Handle

Figure 7 — Center Front Cockpit

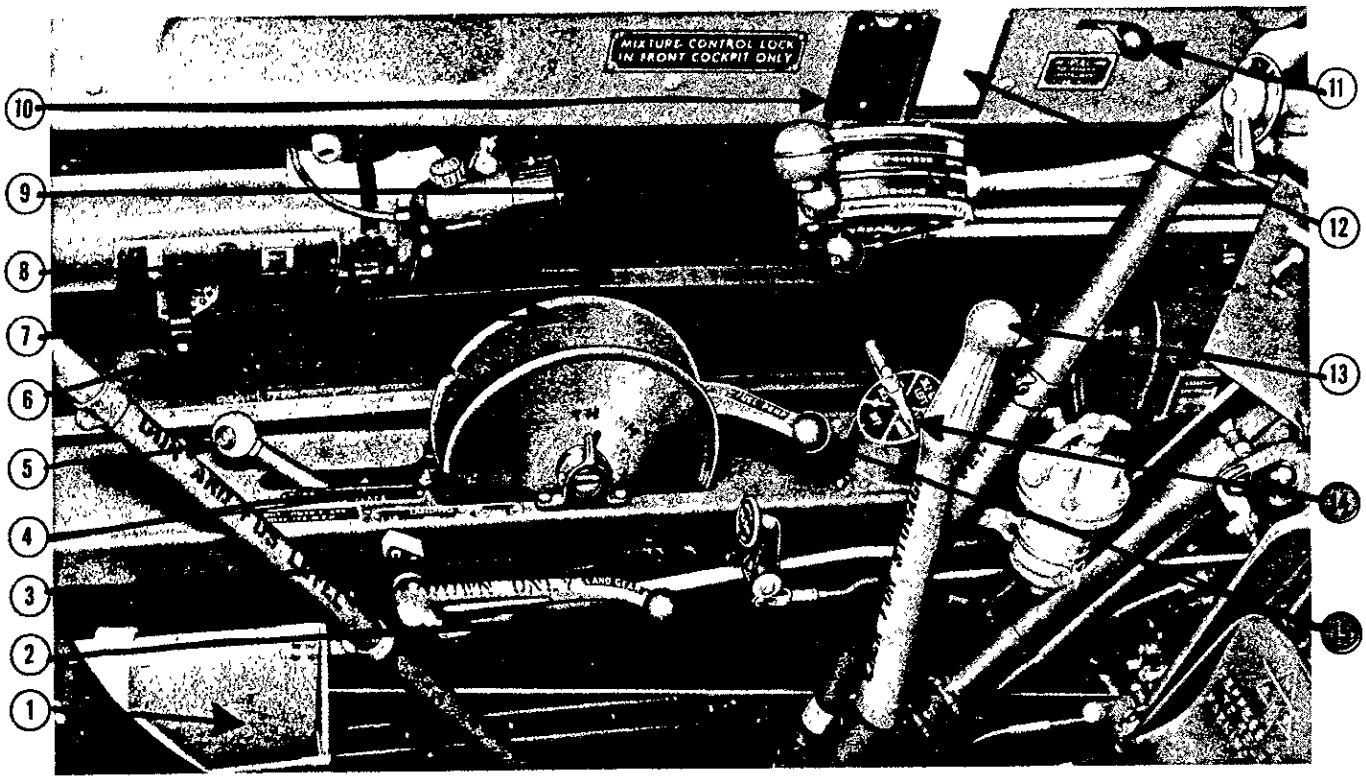


Figure 8 — Left Side Rear Cockpit

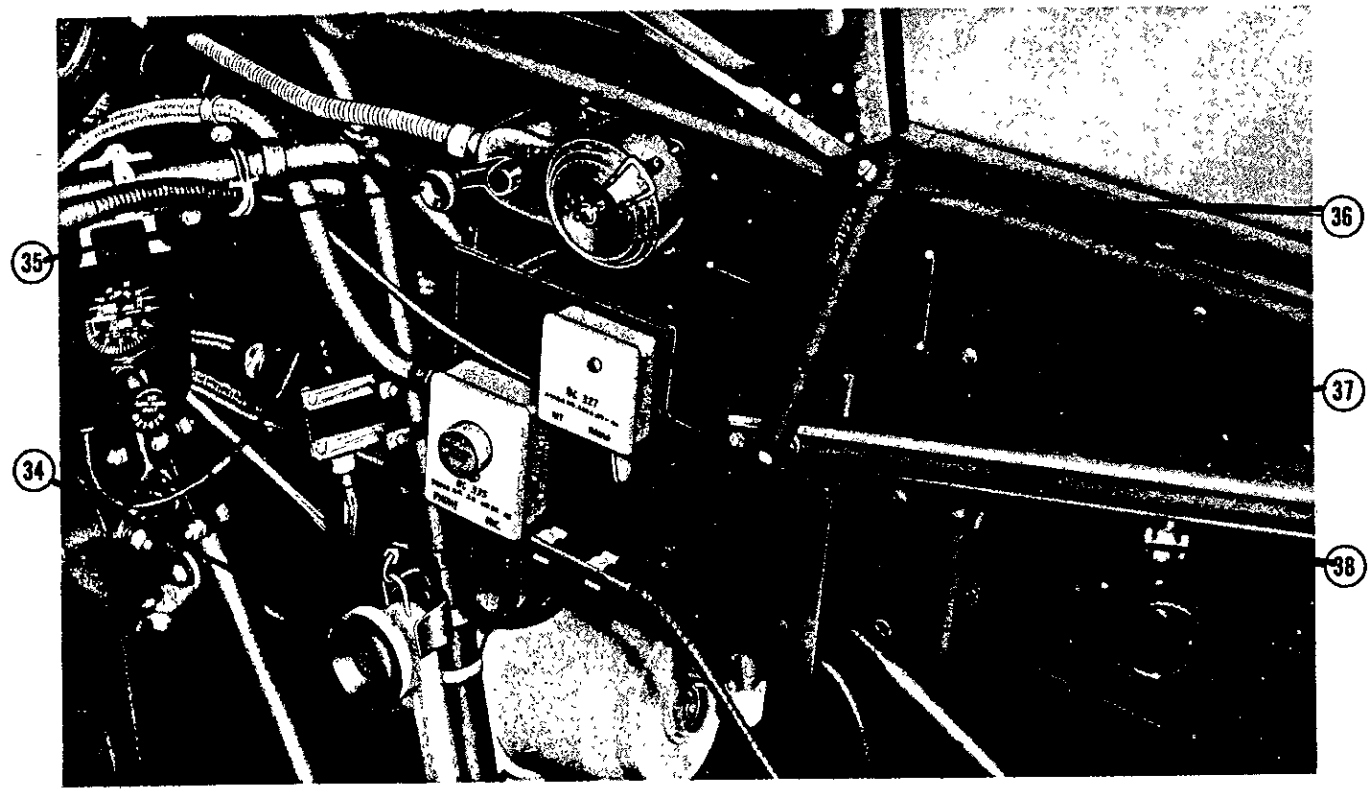
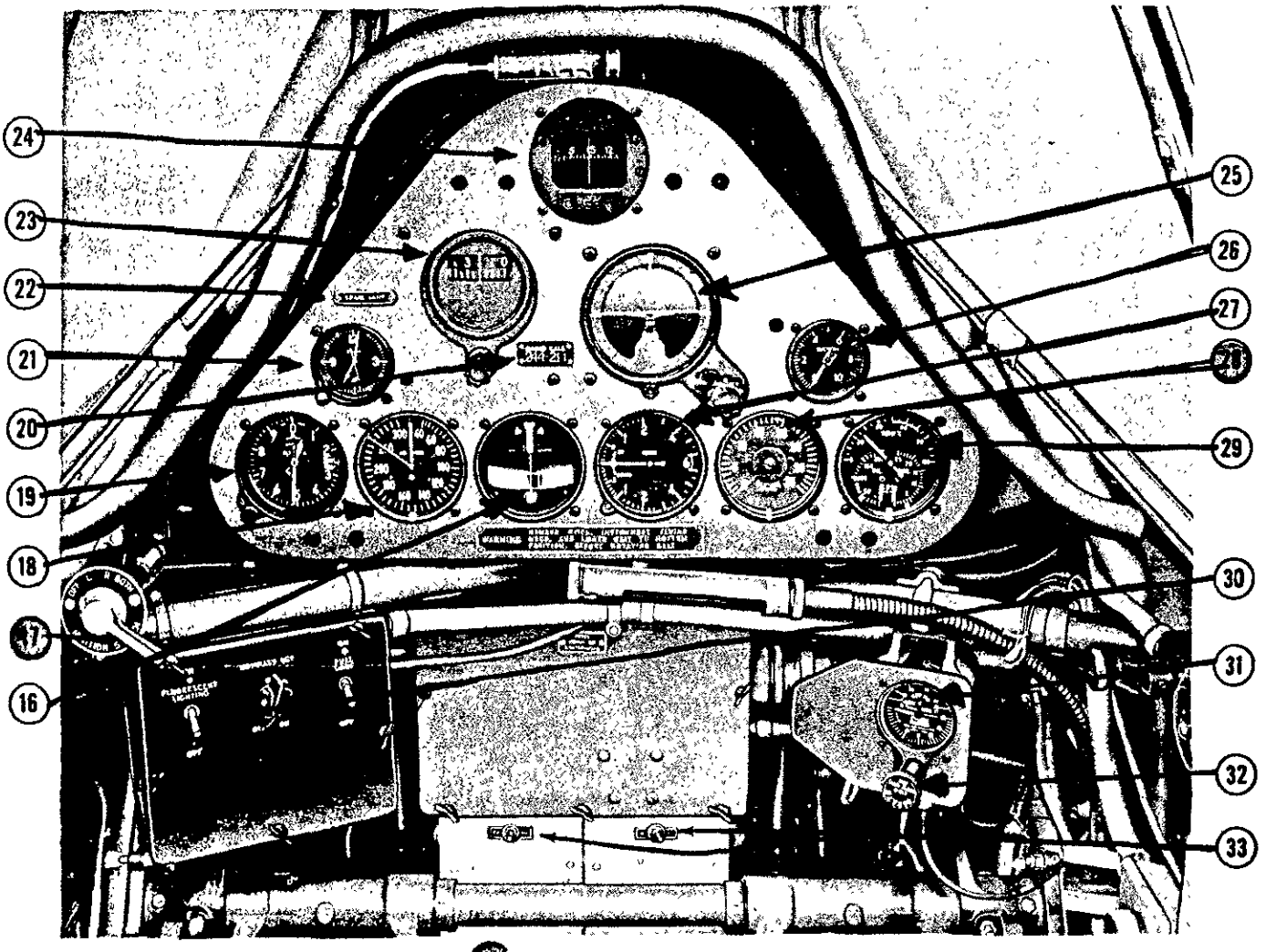


Figure 9 — Right Side Rear Cockpit



POWER PLANT CONTROLS

1. Flight Report Case
2. Landing Gear Controls
3. Hydraulic Power Control
4. Elevator Trim Tab Control
5. Flap Control
6. Ventilator Door Handle
7. Rudder Trim Tab Control
8. Fire Extinguisher
9. Engine Control Quadrant
10. *Altimeter Correction Chart*
11. Blind Flying Hood Release
12. Compass Correction Chart
13. Control Stick (Stowed)
14. Fuel Selector Valve
15. Hand Fuel Pump Handle
16. Bank and Turn Indicator
17. Ignition Switch
18. Air-Speed Indicator
19. Altimeter
20. Radio Call Plate
21. Clock
22. Spare Lamp
23. Directional Gyro
24. Magnetic Compass
25. Gyro Horizon
26. Suction Gage
27. Rate of Climb Indicator
28. Tachometer
29. Oil Temp, Fuel and Oil Pressure Gage
30. Electrical Control Panel
31. Oxygen Pressure and Flow Gage
32. Oxygen Regulator Control
33. Interphone Amplifier Switch
34. Microphone
35. Receiver Tuning Switch
36. Receiver Tuning Dial
37. Radio-Interphone Selector Switch
38. Volume Control

Figure 10 — Center Rear Cockpit

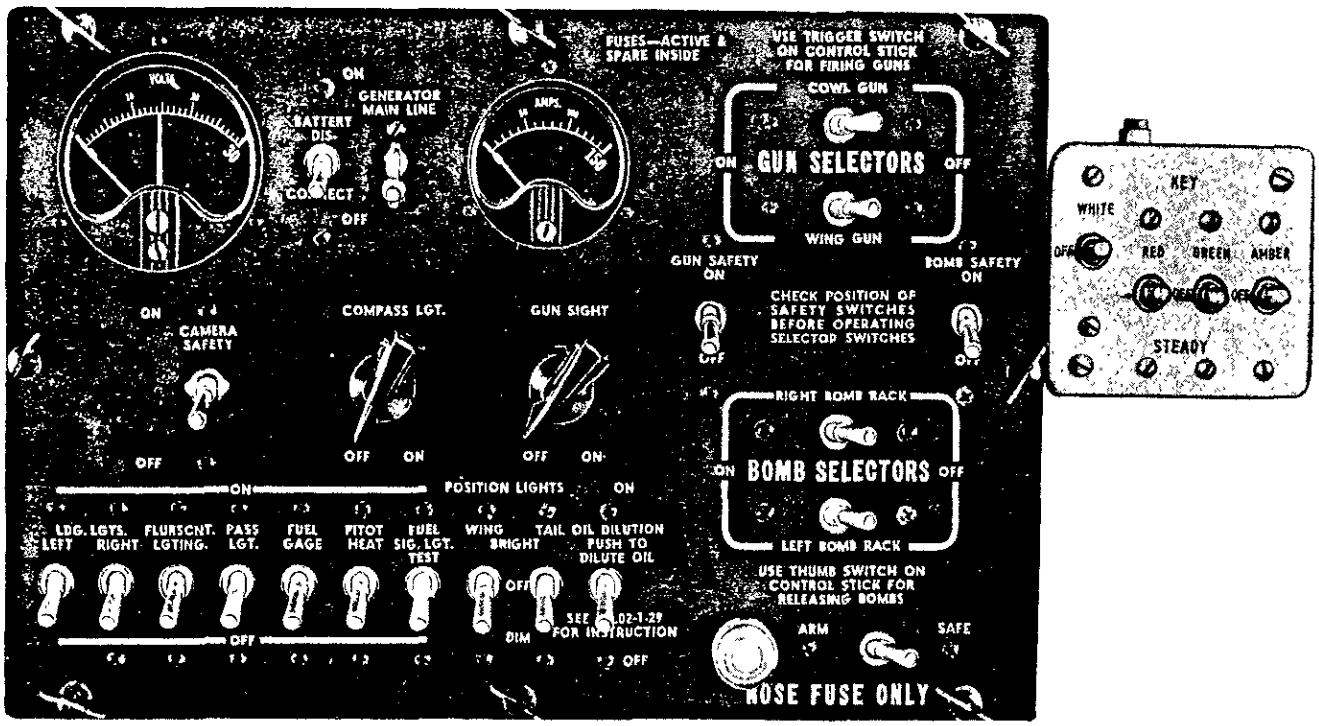


Figure 11—Front Cockpit Electrical Control Panel and Recognition Light Switch Box

b. FUEL SELECTOR VALVE. *(See figures 5 and 8.)*—Selection of fuel supply is controlled by fuel selector valves located on the control shelf of each cockpit. These valves are mechanically interconnected so that movement of one of the selectors will cause the other selector to move in a like manner. The markings on the selector valve indicating fuel selection are "RES," "LEFT," and "RIGHT." All the fuel in the right tank is available with the selector in the "RIGHT" position. In the "LEFT" position, fuel is taken from the left tank through the extended stand pipe until approximately twenty gallons of fuel remain. The remaining fuel (reserve) can be made available to the engine only by moving the selector to "RES." An "OFF" position is provided to shut off completely the flow of fuel.

c. FUEL QUANTITY GAGES. *(See figure 21.)*—Two float-type fuel quantity gages are located one on either side of the front seat. The gages are visible from the rear seat with approximately 5 gallons parallax error. The left gage will register all the fuel remaining in the left tank including the reserve fuel. When this gage reads approximately 20 gallons or less the fuel will be available only if the fuel selector valve is in the "RES" position.

d. FUEL SWITCH-OVER SIGNAL. *(See figure 7.)*—A signal lamp on the right side of the front cockpit instrument panel will light when the carburetor fuel pressure falls below 3 psi. When the fuel flow stops the fuel pressure will drop and cause the lamp to light approximately 10 seconds before engine failure. On the T-6C a testing switch for the lamp is located on the front cockpit electrical control panel.

e. HAND FUEL PUMP. *(See figures 5 and 8.)*—The hand fuel pump is operated to obtain fuel pressure in the case of engine-driven fuel pump failure. An operating handle is located on the control shelf of each cockpit. Insufficient operation of the hand fuel pump will be indicated by the fuel pressure signal lamp.

9. OIL SYSTEM.

(See figure 4.)

a. GENERAL.—A 10 US (8-1/2 Imperial) gallon oil tank provides the reserve supply for the engine lubricating system. Pressure and temperature indicators are

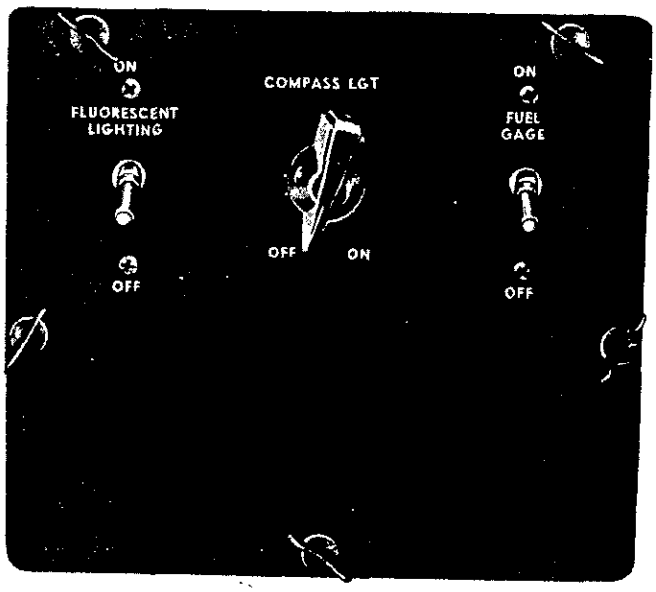


Figure 12—Rear Cockpit Electrical Control Panel

contained in the engine gage units on the two instrument panels. The oil cooler shutter control in the front cockpit is the only manually operated oil system control and is provided for operation in extreme cold weather only. When the handle is in the up position, the shutters are "CLOSED" and when in the down position, the shutters are "OPEN". The control quadrant is notched to permit setting in any intermediate position.

b. OIL DILUTION SYSTEM.—The oil dilution system is controlled by a switch on the front cockpit electrical control panel. With this switch in the "ON"

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position, the solenoid valve opens and allows fuel to enter the oil system at the oil "Y" drain valve to lower the viscosity of the oil for cold weather starts.

10. ELECTRICAL SYSTEM.

a. GENERAL.—A twelve volt direct current electrical system is installed in this airplane. Power for the electrical system is supplied by a 50-ampere engine-driven generator with a 68-ampere-hour storage battery for reserve. Fluorescent and compass lights requiring alternating current are supplied by a d-c to a-c inverter. All circuits except the bomb release and gun firing circuits are fused in the main fuse box at the left side of the front cockpit.

b. CONTROLS. *(See figures 11 and 12.)*—Controls for all electrical equipment are on the electrical control panel in the front cockpit. Controls for the fluorescent, compass, and fuel gage lights are duplicated in the rear cockpit.

c. LIGHTS.—Two swivel-mounted cockpit lights in each cockpit are controlled by a rheostat on the light housing.

A fluorescent lamp is installed on a flexible cable in each cockpit to illuminate the instrument panel.

Position light switches provide two intensities—"DIM" and "BRIGHT".

Landing lights and the passing light are individually controlled.

The red, green, and amber recognition lights are individually controlled by switches adjacent to the front cockpit electrical control panel. The "WHITE" switch has no function in this installation.

11. INSTRUMENTS.

(See figures 7 and 10.)

a. FLIGHT INSTRUMENTS.

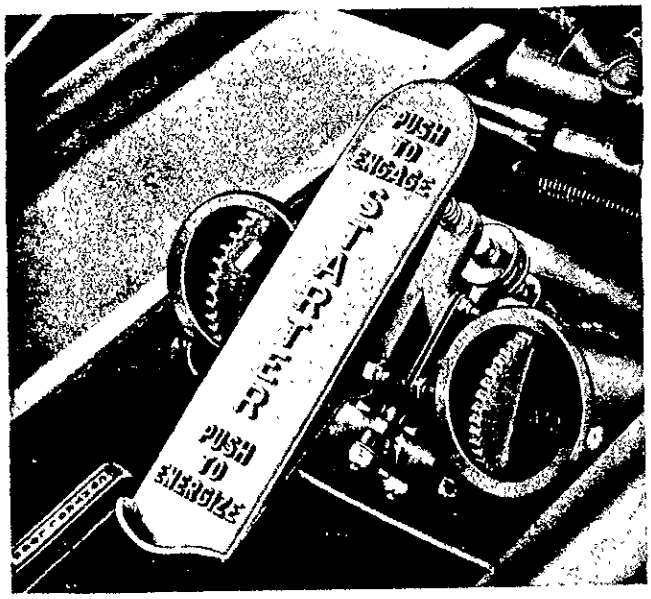


Figure 13 — Starter Switch Pedal

Accelerometer
Air Speed Indicator
Altimeter
Bank and Turn Indicator
Compass, Magnetic
Directional Gyro
Gyro Horizon
Rate of Climb Indicator

These instruments, except the accelerometer which is installed in the front cockpit only, are provided on both instrument panels. The gyro horizon, directional gyro, and bank and turn indicator are gyro instruments run by an engine-driven vacuum pump. The altimeter, rate of climb indicator, and air speed indicator are connected to the pitot head. A pitot head heater switch is located on the front cockpit electrical control panel. Each compass incorporates a lamp controlled by a rheostat located on the respective electrical control panel.

b. ENGINE INSTRUMENTS.

Carburetor Mixture Gage
Cylinder Head Temperature Gage
Engine Gage Unit (fuel and oil pressure, and oil temperature)
Manifold Pressure Gage
Tachometer

These instruments are located on the instrument panel in the front cockpit. The engine gage unit and tachometer are duplicated on the rear cockpit instrument panel.

c. MISCELLANEOUS INSTRUMENTS.

Ammeter
Clock
Free-Air Temperature Indicator
Suction Gage
Voltmeter

The clock and suction gage are installed on both instrument panels. The free-air temperature indicator is installed on the front instrument panel only. The ammeter and voltmeter are located on the front cockpit electrical control panel.

12. HEATING AND VENTILATING SYSTEMS.

Ventilating controls are provided between the rudder pedals in the front cockpit. The volume of hot air taken from the exhaust shroud or cold air from an outside opening is regulated by operating a notched control wheel fitted with a butterfly valve at the outlet of each system. A ventilator door is located at the left rear side of the rear cockpit. A handle located directly beneath the fire extinguisher controls the flow of air.

Airplanes allocated to the United Kingdom contain

a special heating system to heat both cockpits and the wing gun and to defrost the windshield. A control valve is operated by a handle located on the right side of the front cockpit.

13. MISCELLANEOUS EQUIPMENT.

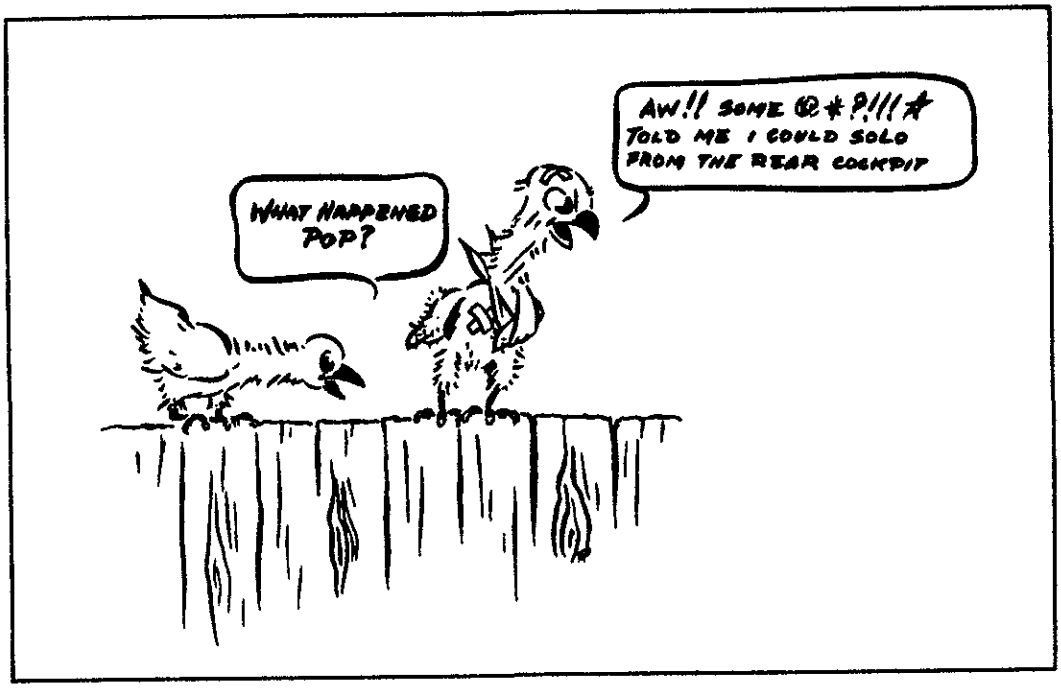
a. PILOT'S RELIEF TUBE.—A relief tube horn is attached by a bracket to the bottom of each seat.

b. ENGINE CRANK.—An engine crank is stowed at the rear of the baggage compartment.

c. INSTRUMENT FLYING HOOD. *(See figure 29.)* —Provisions are included in each cockpit for the installation and operation of an instrument flying hood.

d. DATA AND MAP CASES.—A flight report case is provided at the left side of each cockpit seat and a map and data case is mounted below the radio equipment in the front cockpit.

SECTION II
NORMAL OPERATING INSTRUCTIONS



1. BEFORE ENTERING THE PILOT'S COCKPIT.

a. FLIGHT LIMITATIONS AND RESTRICTIONS.

(1) MANEUVERS PROHIBITED.

Outside loop
Inverted flight in excess of 10 seconds
Snap rolls in excess of 130 MPH IAS
Slow rolls in excess of 190 MPH IAS
Spins and stalls when normal gross weight is exceeded

WARNING

Solo flights should never be made in the rear cockpit.

(2) AIR SPEED LIMITATIONS.

Maximum permissible diving speed is 240 MPH IAS.
With wing flaps set at 45 degrees, do not exceed 125 MPH IAS.
In a sideslip, stay above 90 MPH IAS.
Do not lower landing gear above 150 MPH IAS.

(3) Maximum allowable gross weight for take-off and landing is 6000 pounds.

Note

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

b. DATA CHECK.

(1) Make sure the airplane has been serviced and is ready for flight. Check Form 1.

(2) Check Weight and Balance Charts in the data case to ascertain that the load and balance requirements of the airplane are satisfied.

c. ENTRY.—To gain entrance to either cockpit, lift the latch and push the sliding enclosure.

2. MINIMUM CREW REQUIREMENTS.

The minimum crew requirements for this airplane is one pilot in the front cockpit.

2A. ON ENTERING THE PILOT'S COCKPIT.

a. STANDARD CHECK FOR ALL FLIGHTS.

(1) Adjust rudder pedals for proper leg length to obtain full brake control while taxiing. *(See figure 15.)*

(2) Adjust the seat level to obtain full rudder travel. *(See figure 16.)*

(3) See that ignition switch *(33 figure 7)* is "OFF".

(4) Set parking brakes *(61 figure 7)*.

(5) Check that all armament switches are "OFF". *(See figure 11.)*

Figure 14—Instrument Marking—Replaced by Chart on Page 24A.

Figure 15 — Rudder Pedal and Adjustment

(6) See that landing gear control handle *(4 figure 5)* is in the "DOWN" position.

(7) Unlock the surface control lock. *(See figure 17.)*

(8) Set altimeter *(36 figure 7)* to correct barometric pressure.

(9) Place battery-disconnect switch in "ON" position. *(See figure 11.)*

(10) Check gun sight illumination by placing "GUN SIGHT" rheostat in "ON" position. *(See figure 11.)*

(11) Check pitot head heater by placing "PITOT HEAT" switch in "ON" position momentarily. *(See figure 11.)*

CAUTION

If pitot head heater is left on for relatively long periods on the ground, the element may be damaged or burned out.

(12) If use of interphone equipment is desired, check the system for proper functioning. For operating instructions, see section V.

(13) Check fuel pressure warning light by operating test switch. *(See figure 11.)*

(14) If oxygen is to be used, check for satisfactory operation. Check gage for pressure above 1800 lb/sq in.

(15) Generator switch—Check "ON" *(See figure 11.)*

b. SPECIAL CHECK FOR NIGHT FLIGHTS.—*(See figure 11.)*

(1) Turn "ON" desired cockpit and instrument lights.

(2) Turn "ON" the fuel gage lights.

(3) Turn "ON" compass lights.

(4) Turn position lights to "DIM" and "BRIGHT"

(5) Check operation of landing lights and passing light.

(6) Check operation of recognition lights.

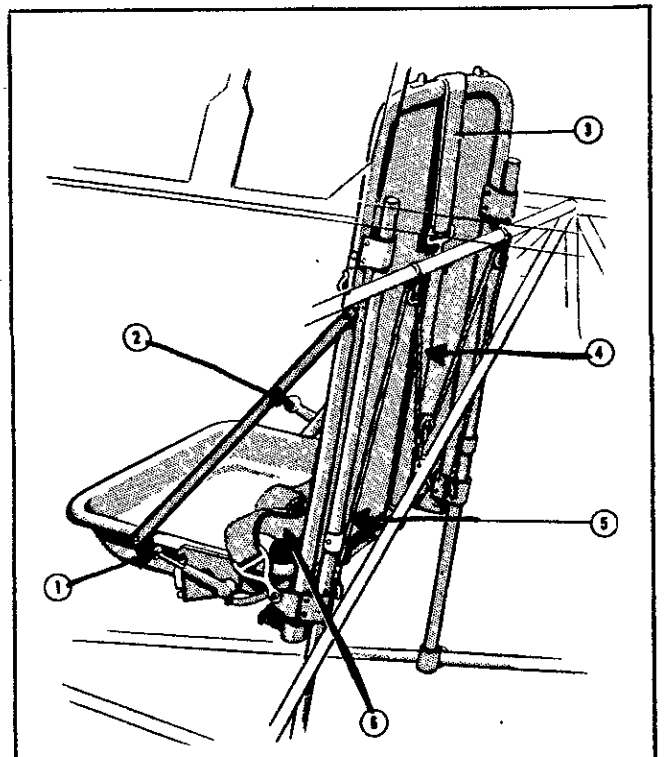
CAUTION

Do not operate recognition, passing, or landing lights for more than 10 seconds when the airplane is on the ground, as there must be air circulation to dissipate the heat from the light.

3. FUEL AND OIL SYSTEM MANAGEMENT.

a. Check fuel selector valve *(6 figure 5)* operation before take-off. The following fuel selector valve positions are recommended:

Start	"RESERVE"
Warm-up	Check all tanks
Taxying and take-off	"RESERVE"
Cruise	"LEFT" and "RIGHT" to maintain trim
Acrobatics	"RESERVE"
Landing	"RESERVE"



1. Shoulder Harness Operating Lever
2. Elevation Lock Handle
3. Shoulder Harness
4. Shoulder Harness Take-Up Mechanism
5. Shock Cord
6. Safety Belt

Figure 16 — Pilot Seat

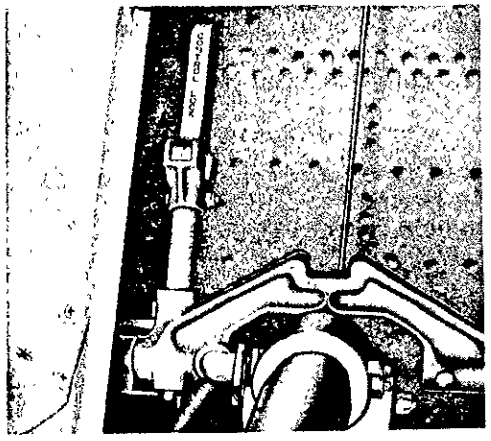


Figure 17—Surface Control Lock

WARNING

If the plane has been subjected to maneuvers prior to using the reserve fuel, the supply in the reserve tank may be as low as 10 gallons.

b. Oil dilution is accomplished in the following manner:

(1) Operate the engine at 1000 to 1200 rpm.

(2) Maintain oil temperature from 5° to 50°C and oil pressure above 15 lb/sq in.

(3) Dilute engine oil as follows for ground temperatures shown: (The oil dilution switch must be held "ON.") *(See figure 11.)*

4° to −12°C (40° to +10°F) 3 minutes
−12° to −29°C (10° to −20°F) 6 minutes
−29° to −46°C (−20° to −50°F) 9 minutes
Add 1 minute of dilution for each additional 5°C (9°F) below −46°C.

(4) During the last minute of dilution, increase rpm to 1500 and slowly move the throttle *(1 figure 21)* to give 26 in. Hg and then back to the original position.

4. STARTING ENGINE.

a. Head the airplane into the wind and set the parking brakes.

b. If flying solo, make certain that the rear cockpit stick is locked in the *stowed* position. See that there is no equipment in the rear cockpit that might foul the controls.

c. Visually check that fire guard is posted.

d. See that ignition switch is "OFF".

e. Have ground personnel turn propeller 6 blades by hand.

f. Open throttle *(1 figure 21)* approximately ½ inch (600-800 rpm).

g. Battery-disconnect switch—Check "ON."

CAUTION

Use hand crank for all cold weather starts.

h. Move mixture control *(3 figure 21)* to full "RICH".

i. Propeller control *(5 figure 21)* in full "DECREASE RPM".

j. Place carburetor air control *(7 figure 5)* to full "COLD".

k. Ascertain that the oil cooler shutters *(60 figure 7)* are "OPEN".

l. Turn fuel selector to "RESERVE". *(See figure 18.)*

m. Check to see that propeller is clear.

WARNING

Use of wobble pump when starting engine may flood carburetor with subsequent fire hazard. Use wobble pump only to fill carburetor after replacement or drainage.

n. Engage the starter. After propeller turns over two or three revolutions, turn the ignition switch to "BOTH." As the engine starts, disengage the starter.

WARNING

If a fire develops because of backfiring, it can be extinguished by immediately re-engaging the starter.

o. Operate primer in slow even strokes until engine starts firing evenly.

p. After the engine has fired, manipulate the throttle to obtain 500 to 600 rpm as quickly as possible.

q. Check the oil pressure. If oil pressure gage registers no pressure after 30 seconds, stop the engine and investigate.

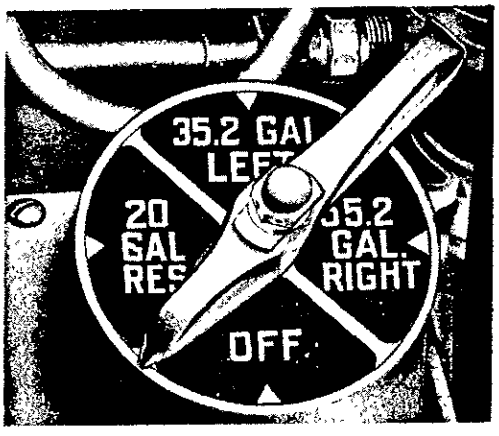


Figure 18—Fuel Selector Control

5. WARM-UP AND GROUND TEST.

WARNING

Do not operate engine between 1450 and 1800 rpm during ground operations.

a. When oil pressure is within limits adjust throttle to obtain the smoothest operation between 1200 and 1400 rpm. Warm-up at this speed will assure best possible operation of the engine.

b. Set propeller control at full "INCREASE RPM".

c. Check instruments for desired range.

d. Check reserve, left, and right fuel systems by rotating fuel selector *(6 figure 5)*.

e. Open manifold pressure gage drain *(12 figure 5)* momentarily.

f. Check operation of wing flaps with hand pump and engine-driven hydraulic pump.

g. Ignition switch check: (To be accomplished before taxiing).

(1) Throttle—700 rpm.

(2) Engine ignition switch—"OFF," momentarily. Observe that the engine completely ceases firing. Perform this check as rapidly as possible in order to prevent severe backfire when switch is turned on again.

(3) If the engine does not cease firing, a magneto ground lead may be open. Shut down the engine and caution personnel to remain clear of the propeller until the difficulty has been remedied.

CAUTION

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

h. Check to determine that generator cuts in for charging between 1000 and 1200 rpm by checking voltmeter and ammeter.

i. Cruising fuel air mixture check:

(1) Throttle—1800 rpm.

(2) Mixture control—"RICH."

(3) After engine speed and instruments have stabilized, move mixture control into the manual lean range until approximately 100 rpm drop is noted; then return to "RICH."

(4) A change of over 25 rpm increase as a result of mixture change indicates an excessively rich carburetor.

j. At 1800 rpm, move propeller control back to note 200 rpm drop (maximum); then move forward to full "INCREASE RPM."

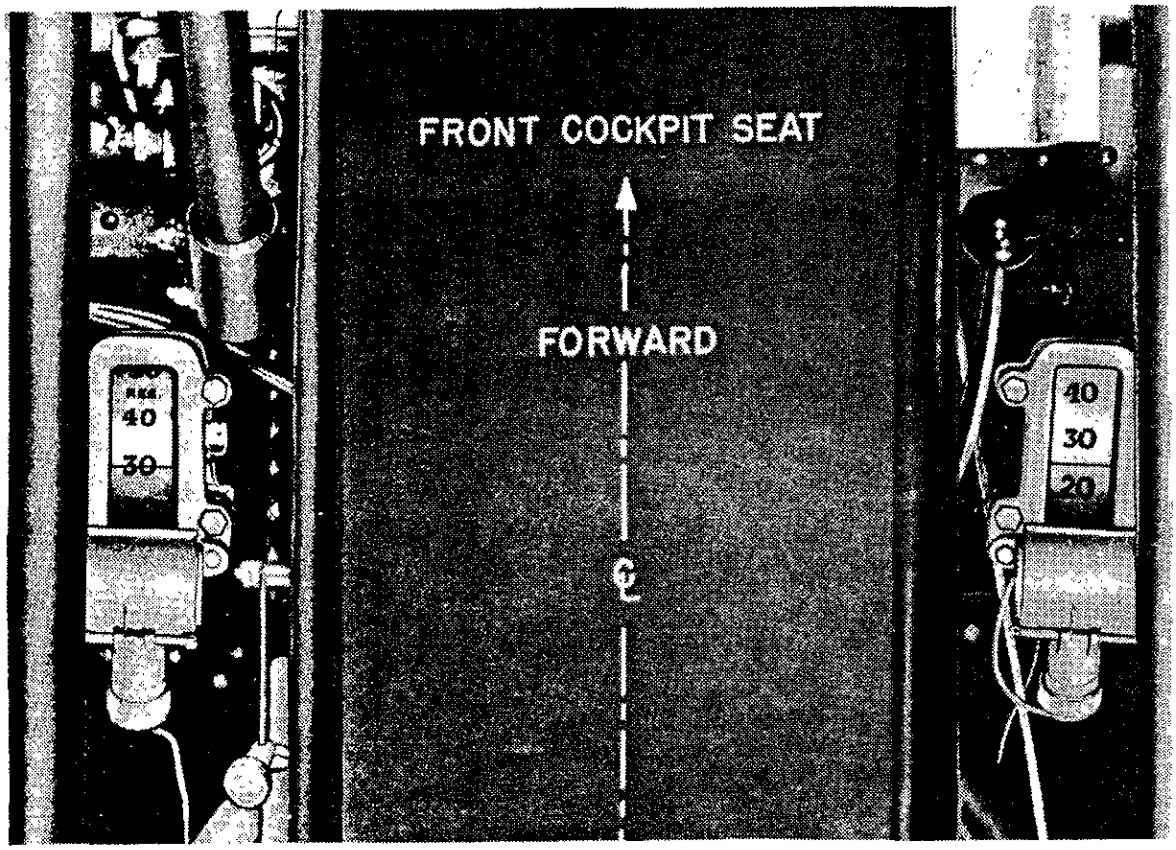


Figure 19—Fuel Contents Gages

k. Power check:

(1) Throttle—2000 rpm.

(2) Note manifold pressure. The manifold pressure reading on different engines of same type and model for a given rpm and geographical location with same propeller installation should not vary more than one inch. In the event the manifold pressure is high, it indicates that the engine is not operating properly.

(3) Check instruments for desired range.

l. Ignition system check:

(1) Throttle—2000 rpm.

(2) Propeller control—"INCREASE RPM."

(3) Accomplish a single ignition check with a maximum allowable drop of 100 rpm. Tachometer and manifold pressure readings must be allowed to stabilize after switching to one magneto. Operation on single ignition for a period as long as one minute is permissible, but should not be exceeded. The ignition switch will be returned to "BOTH" position prior to checking the other magneto.

m. Acceleration and deceleration check:

(1) Mixture control—"RICH."

(2) Accelerate and decelerate the engine. The engine should accelerate and decelerate rapidly and smoothly with no tendency to backfire.

n. Idle speed check:

(1) Throttle—"CLOSED."

(2) Idle speed should be 450 rpm.

o. Check flying controls for free and correct movement. Look at control surfaces.

(16B Blank)

p. Set the elevator and rudder trim tabs *(8 and 9 figure 5)* at "NEUTRAL."

q. Check communication equipment for proper operation. (See section V, paragraph 1.)

r. Release parking brakes.

6. SCRAMBLE TAKE-OFF.

Use oil dilution (2 minutes maximum) to obtain proper oil pressure at moderate power. Check for a rise in oil temperature, and as soon as the engine will *take* the throttle, release the parking brakes, taxi out, and take-off.

7. TAXIING INSTRUCTIONS.

a. Steer a zigzag course to obtain an unobstructed view.

b. Use the brakes as little as possible and always taxi cautiously.

c. Upon reaching the take-off position, stop the airplane cross-wind so approaching airplane may be seen plainly.

d. If take-off is delayed, clear the engine by opening the throttle against the brakes to about 25 in. Hg manifold pressure (1900 rpm).

8. TAKE-OFF.

a. When take-off area is clear, quickly check the following:

(1) Mixture control full "RICH"

(2) Fuel selector on "RESERVE" (Check fuel levels.)

(3) Fuel pressure within limits

(4) Propeller control full "INCREASE RPM"

(5) Carburetor air control in full "COLD"

(6) Wing flaps "UP" (If high obstacles are to be cleared and only a short run is available, place flaps in 15 degrees down.)

(7) Gyro instruments uncaged

Note

Gyro instruments should be left uncaged at all times except during acrobatics. When the rear cockpit is unoccupied, cage the rear gyro instruments before take-off.

(8) Oil pressure within limits
(9) Oil temperature within limits
(10) Cylinder head temperature within limits

b. Adjust throttle friction sufficiently to prevent creepage if hand is removed.

c. Check lap belt, tighten and lock shoulder harness.

d. Turn into the wind and lock the tail wheel if the airplane is equipped with a lockable tail wheel.

e. Open throttle gradually to 36 in. Hg and take-off at 2250 rpm (maximum cylinder head temperature 260°C for 5 minutes).

f. Do not attempt to lift the tail too soon, as this increases the torque action. Maintain a constant attitude until sufficient speed in attained, then raise the tail slowly.

9. ENGINE FAILURE DURING TAKE-OFF.

a. To reduce the possibility of and danger from engine failure during take-off, observe the following practices:

(1) Run up engine carefully and check thoroughly before take-off.

(2) Retract the landing gear as soon as the airplane is definitely air-borne.

(3) If flaps are used, raise as soon as the airplane reaches a safe altitude.

b. If the engine fails immediately after take-off:

(1) Depress the nose at once so that the air speed does not drop below stalling speed.

(2) If bombs are installed, salvo them immediately.

(3) Open the sliding enclosure.

(4) If the landing gear has started to come up, *do not try to lower it.*

(5) Lower the flaps fully if possible.

(6) Turn "OFF" ignition switch and battery disconnect switch.

(7) Turn fuel selector valve "OFF."

(8) Land straight ahead, changing direction only to miss obstructions.

10. CLIMB.

As soon as the airplane is sufficiently clear of the ground, proceed as follows:

a. Push the hydraulic power control lever *(1 figure 5).*

b. Retract the landing gear. Pull the landing gear control *(4 figure 5)* to the "UP" position and leave it up.

c. Ease back on the throttle to 32.5 in. Hg and propeller control to about 2200 rpm. Climb at 115 MPH IAS.

d. Raise the flaps if used. Pull the flap control *(2 figure 5)* to the "UP" position and leave it up.

CAUTION

Always reduce manifold pressure first, then rpm. Move throttle and propeller controls slowly.

e. Check the cylinder head and oil temperatures and the oil pressure.

f. Turn the fuel selector from "RESERVE" to "LEFT" or "RIGHT" to maintain trim.

g. Adjust the trim tabs *(8 and 9 figure 5)* so that airplanes flies *hands off.*

h. Refer to "Take-Off, Climb, and Landing Chart", appendix I, for rates of Climb applicable.

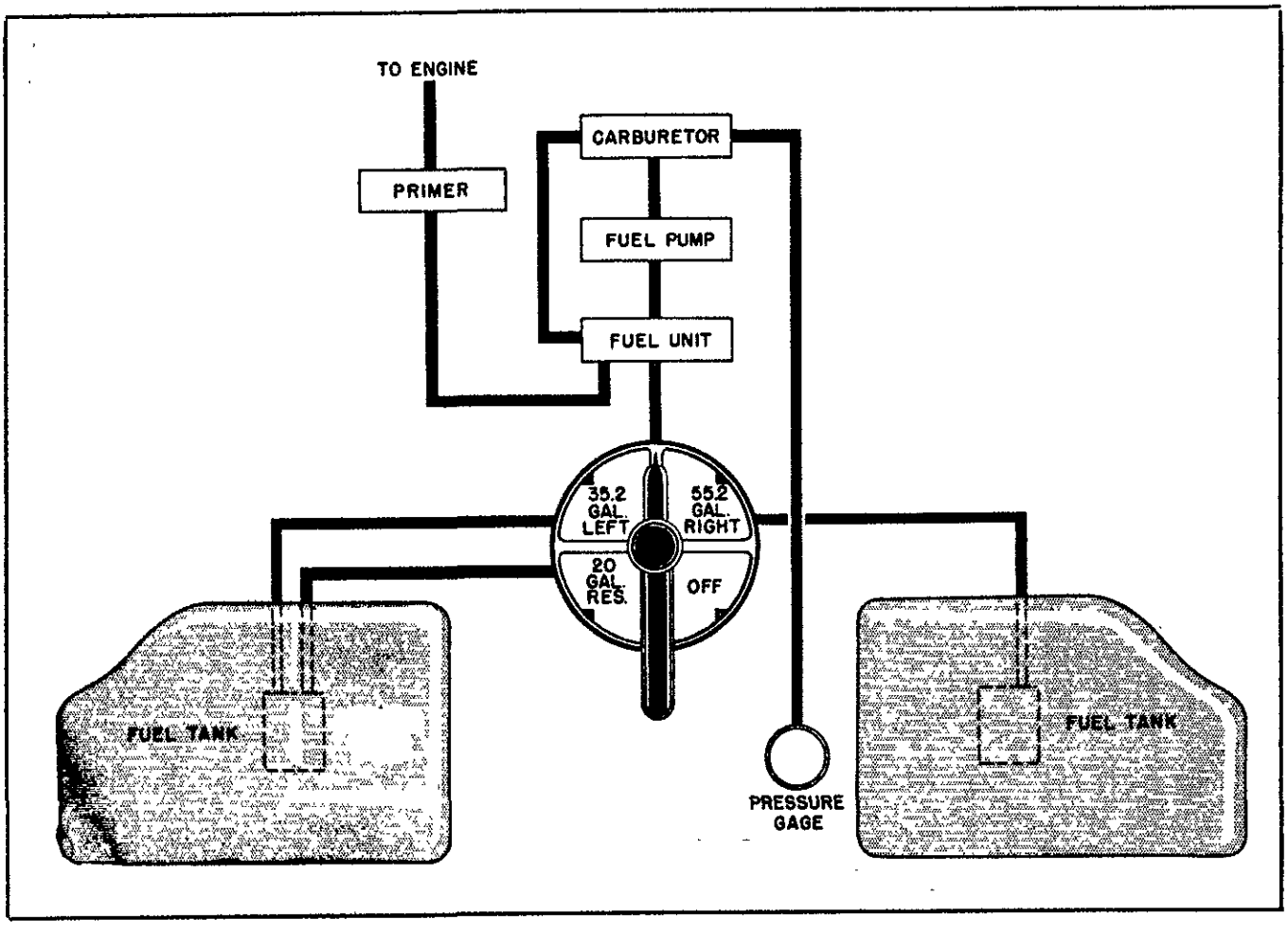


Figure 20—Fuel Flow Diagram

11. GENERAL FLYING CHARACTERISTICS.

a. The lowest fuel consumption is obtained by using a lean mixture and throttling down the engine to the lowest speed at which the airplane will fly satisfactorily and the engine will run smoothly. This speed is 130 mph at 1600 rpm and 24 in. Hg, the propeller in "DECREASE RPM", at approximately 1000 feet altitude.

b. Although less economical, the desired cruising conditions are 1850 rpm, 26 in. Hg, and 155 mph at 5,000 feet altitude. Do not lean the mixture too much, as serious damage may result from overheated cylinders.

c. For engine operation, refer to "Power Plant Chart", section III, and "Flight Operation Instruction Charts", appendix I.

d. The effect of flap and landing gear operation on the trim of the airplane in flight is as follows:

Landing gear retracted	no effect
Landing gear extended	no effect
Flaps lowered	nose heavy
Flaps raised	tail heavy
Flaps raised from full down at 80 MPH IAS	airplane sinks approximately 20 feet
Flaps raised from full down at 75 MPH IAS	airplane sinks approximately 40 feet

e. Air speed must not fall below 90 MPH IAS while sideslipping. Recovery from a sideslip should be effected above 200 feet.

f. Surface controls, particularly the rudder, are slightly less responsive with the flaps down; therefore turns and sideslips with the flaps fully lowered must not be made with less than 400 feet altitude.

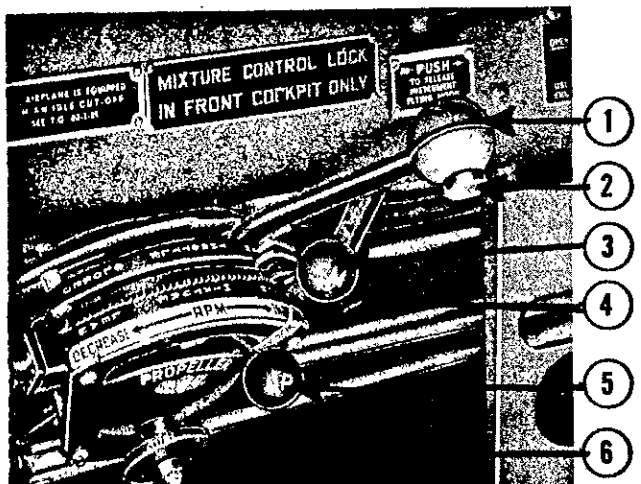
g. Runaway propeller caused by excess power and decreased load on the engine, present in a prolonged steep dive, should be corrected by reducing the throttle setting and returning the airplane to normal flight attitude. During such dives, keep manifold pressure above 15 in. Hg, pay careful attention to tachometer readings, and reduce the throttle as necessary to prevent increased engine speed. A quick increase in throttle setting after the throttle has been retarded, with propeller control set for 1900 rpm, can also cause a runaway propeller. This change in rpm usually occurs at the critical period following take-off or in approach for landing when the throttle is momentarily decreased to check operation of the landing gear warning horn, at which time little excess altitude is available for emergencies. This rapid increase may cause the engine to overspeed which destroys the sensitive balance of constant speed control. To remedy, immediately put an increased load upon the

ting and returning the airplane to normal flight attitude. During such dives, keep manifold pressure above 15 in. Hg, pay careful attention to tachometer readings, and reduce the throttle as necessary to prevent increased engine speed. A quick increase in throttle setting after the throttle has been retarded, with propeller control set for 1900 rpm, can also cause a runaway propeller. This change in rpm usually occurs at the critical period following take-off or in approach for landing when the throttle is momentarily decreased to check operation of the landing gear warning horn, at which time little excess altitude is available for emergencies. This rapid increase may cause the engine to overspeed which destroys the sensitive balance of constant speed control. To remedy, immediately put an increased load upon the engine and propeller by putting the airplane in a climbing attitude, if possible, and slowly retard the throttle setting until the rpm again comes under control.

b. Gliding may be carried out at any safe speed down to the recommended margin of about 25 percent above stalling speed. With the landing gear and flaps up the glide is very flat, and at the best gliding speed of about 100 MPH IAS, long distances can be covered for a comparatively small loss of altitude. Lowering either flaps or landing gear greatly steepens the gliding angle and increases the rate of descent.

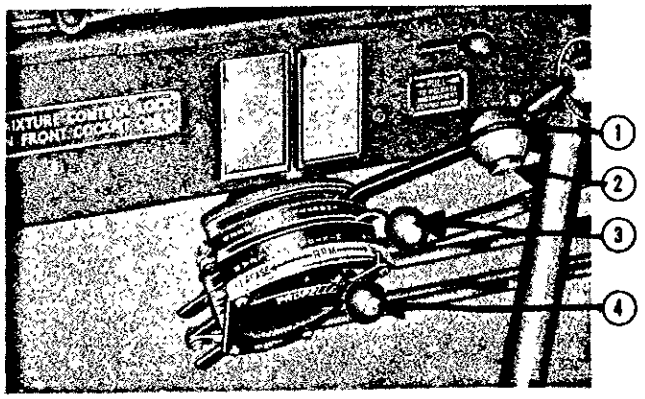
GLIDING SPEED CHART

IAS (MPH)	GLIDING ANGLE	L. G. and FLAPS	POWER
100	Best	"UP"	"OFF"
95	Best	"DOWN"	"OFF"
90	Steep	"DOWN"	"OFF"
85	Best	"DOWN"	"ON"
80	Steep	"DOWN"	"ON"



1. Throttle Control
2. Throat Microphone Switch
3. Mixture Control
4. Mixture Control Lock Release
5. Propeller Control
6. Friction Lock

Figure 21 — Engine Control Quadrant — Front Cockpit



1. Throttle Control
2. Throat Microphone Switch
3. Mixture Control
4. Propeller Control

Figure 22 — Engine Control Quadrant — Rear Cockpit

12. STALLS.

STALLING SPEED CHART

GROSS WEIGHT	GEAR AND FLAPS UP	GEAR AND FLAPS DOWN
5300 Pounds	72 mph (IAS)	64 mph (IAS)
6000 Pounds	77 mph (IAS)	69 mph (IAS)

a. When the stalling incidence is reached with landing gear and flaps up, a wing will drop. If the backward movement on the stick continues when the wing drops, the airplane will fall into a steep spiral. The stalling incidence is reached with the control stick only a short distance back when the airplane nears stalling speed, because of sensitive elevators.

b. Decrease the whip when stalling by putting the stick forward at the start and applying opposite rudder. If putting the stick forward is delayed until the airplane is on its back, an inverted spin may result.

c. No warning of a stall should be relied on, although buffeting and pitching usually precede a stall.

d. During a practice stall, do not pull the nose up in order to stall; instead, counteract its tendency to sink by easing back the stick. When a wing drops, put the stick forward at once and apply opposite rudder.

e. With flaps and landing gear down, stalling incidence is reached about 64 mph IAS. As speed is reduced, the right wing drops quickly and; unless recovery is effected immediately, the airplane may whip into a half roll and attempt to spin.

13. SPINS.

Spins should not be made intentionally with flaps and landing gear down. Should an inadvertant spin occur, recovery can be effected after 1-1/2 or 2 turns by first applying full opposite rudder and then pushing the control stick forward to neutral. The ailerons are held in the neutral position. Centralize the rudder as soon as the airplane is in a straight dive to prevent a spin in the opposite direction. Bring the airplane out of the dive and return the control stick to neutral.

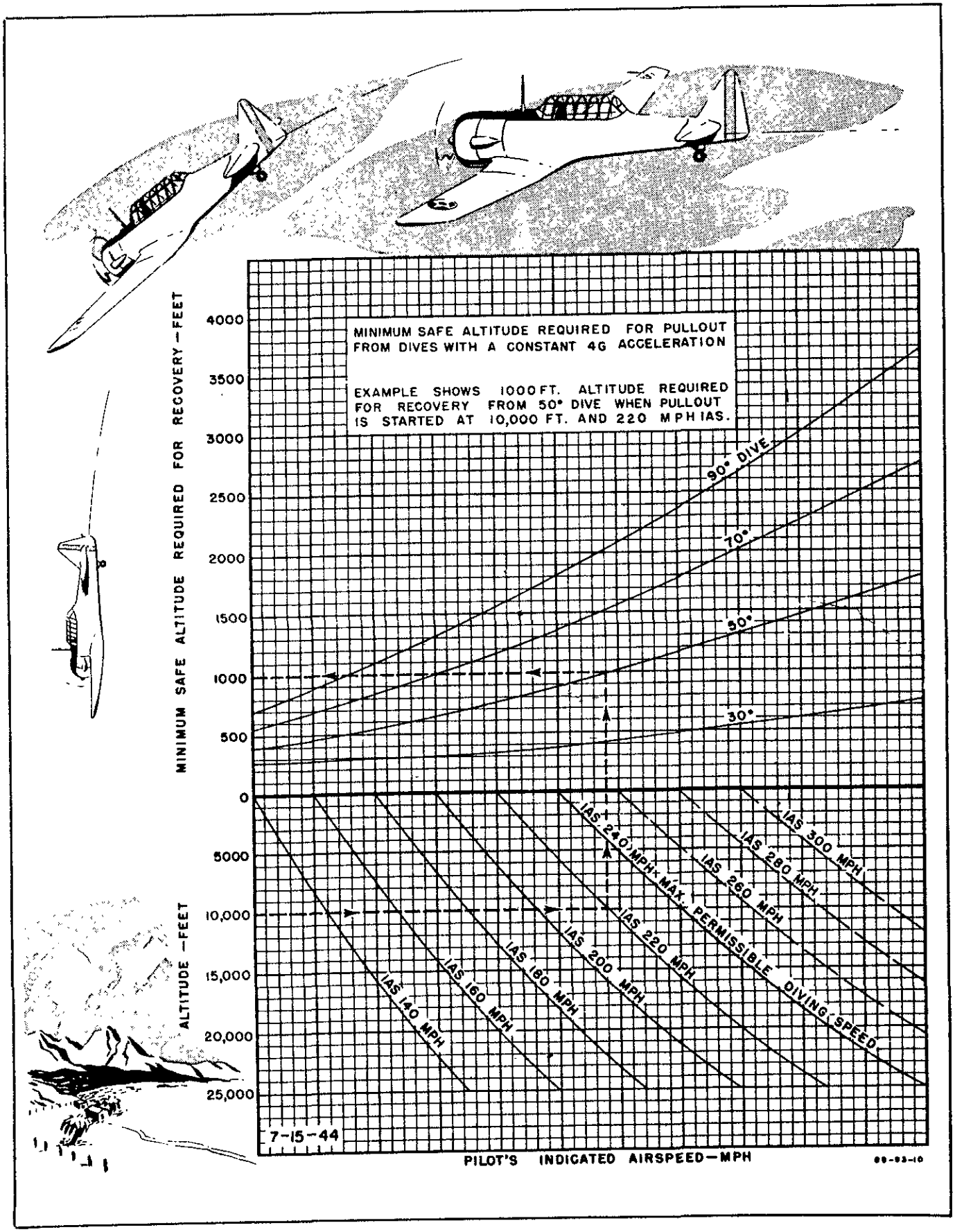


Figure 23 — Diving Speed Chart

14. PERMISSIBLE ACROBATICS.

The acrobatic qualities of this airplane are exceptional, and the lateral control is excellent at all speeds. All normal acrobatics except those prohibited in paragraph 1 of this section are permitted; however, inverted flying must be limited to 10 seconds because of engine difficulties resulting from prolonged inverted flight.

15. DIVING.

(See figure 23.)

The maximum permissible diving speed is 240 IAS, during which the engine speed must not exceed 2800 rpm and 20 in. Hg with the throttle open 1/3 or more. However, with the throttle closed, 2200 rpm is the maximum allowable to keep engine stresses down. The propeller must be in the "DECREASE RPM" position in a dive. Move the control to "DECREASE RPM" while the throttle is still partially open to prevent the propeller blades from remaining set in "INCREASE RPM" during the dive. The use of elevator tabs is not required for dive recovery.

16. NIGHT FLYING.

The sequence outlined for daylight operation should be observed even more strictly for night flights. In addition, the pilot should familiarize himself with the location of the different lights and their switches.

17. APPROACH AND LANDING.

(See figure 24.)

a. APPROACH.—When the airplane approaches the field, adhere to the following sequence of operation:

(1) Check lap belt, tighten and lock shoulder harness.

(2) Place fuel selector on "RESERVE". *(See figure 18.)*

(3) Set mixture control *(3 figure 21)* in full *"RICH"*.

(4) Set propeller control *(5 figure 21)* in the maximum cruising rpm position (2000 rpm).

(5) Reduce speed to less than 150 MPH IAS.

(6) Press the hydraulic power control lever *(1 figure 5)*.

(7) Lower the landing gear by placing the landing gear control *(4 figure 5)* in the "DOWN" position. Leave the control in the "DOWN" position.

(8) Check tail wheel for locked position if the airplane is equipped with a lockable type tail wheel.

(8A) Reduce speed to less than 126 MPH IAS.

(9) Lower the flaps at 95 MPH IAS as needed on final approach after the turn into the field has been made. The flaps are lowered by placing the flap control *(2 figure 5)* in the "DOWN" position and leaving it there.

b. LANDING.

(1) GENERAL.—Having turned into the field and lowered the flaps, adjust the rudder and elevator trim tabs *(8 figure 5)* to maintain a correct gliding speed. Having stopped after landing, raise the flaps before taxiing. Unlock the tail wheel for parking or towing.

(2) CROSS-WIND LANDING.—As this airplane has a landing gear of wide tread, cross-wind landings may be negotiated safely. Keep one wing down, into the wind, to counteract drift.

(3) TAKE-OFF IF LANDING IS NOT COMPLETED.—In the event of an unsuccessful attempt to land, open the throttle and take-off. Raise the landing gear immediately; then, when the air speed has reached

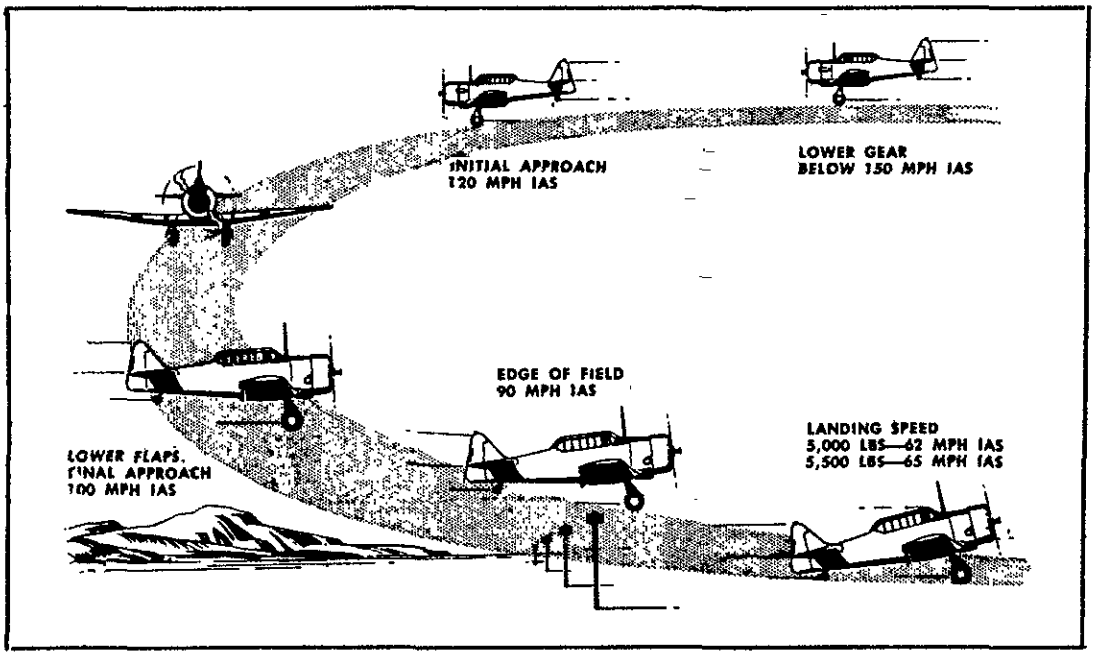


Figure 24—Landing Diagram

100 MPH IAS and with an altitude of at least 300 feet, raise the flaps *(2 figure 5)*.

18. STOPPING OF ENGINE.

CAUTION

Because of the critical nature of the generator drive, extra care must be taken in operating the engine of this aircraft. Rapid reversal or "jockeying" of the throttle must be avoided. The practice of sudden throttle movement, especially closing, is detrimental.

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

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

b. If a cold weather start is anticipated, dilute the engine oil as outlined in paragraph 3 of this section.

c. Open the throttle to about 1200 rpm and put propeller control *(5 figure 21)* at "DECREASE RPM"; allow engine to run for one minute.

d. Place mixture control *(3 figure 21)* in full "LEAN", making use of idle cut-off.

e. Place throttle *(1 figure 21)* in full "OPEN".

f. Turn ignition switch *(33 figure 7)* "OFF" after engine ceases firing.

g. Turn fuel selector "OFF". *(See figure 18.)*

19. BEFORE LEAVING COCKPIT.

After engine stops, proceed as follows:

a. Turn "OFF" all switches except generator switch.
b. Move throttle to "CLOSED".
c. Lock the surface controls. *(See figure 17.)*
d. Release parking brakes after chocks are in place.

20. MOORING.

(See figure 25.)

a. Head the airplane into the wind.
b. Place chocks in front of wheels.
c. Lock the surface controls.
d. Insert the mooring rings in the wings. Moor the airplane to ground mooring rings or sandbags with ¾-inch rope or ¼-inch cable. Secure the tail at the lift-mooring tube or by lashing directly to the tail wheel fork.
e. Install covers.

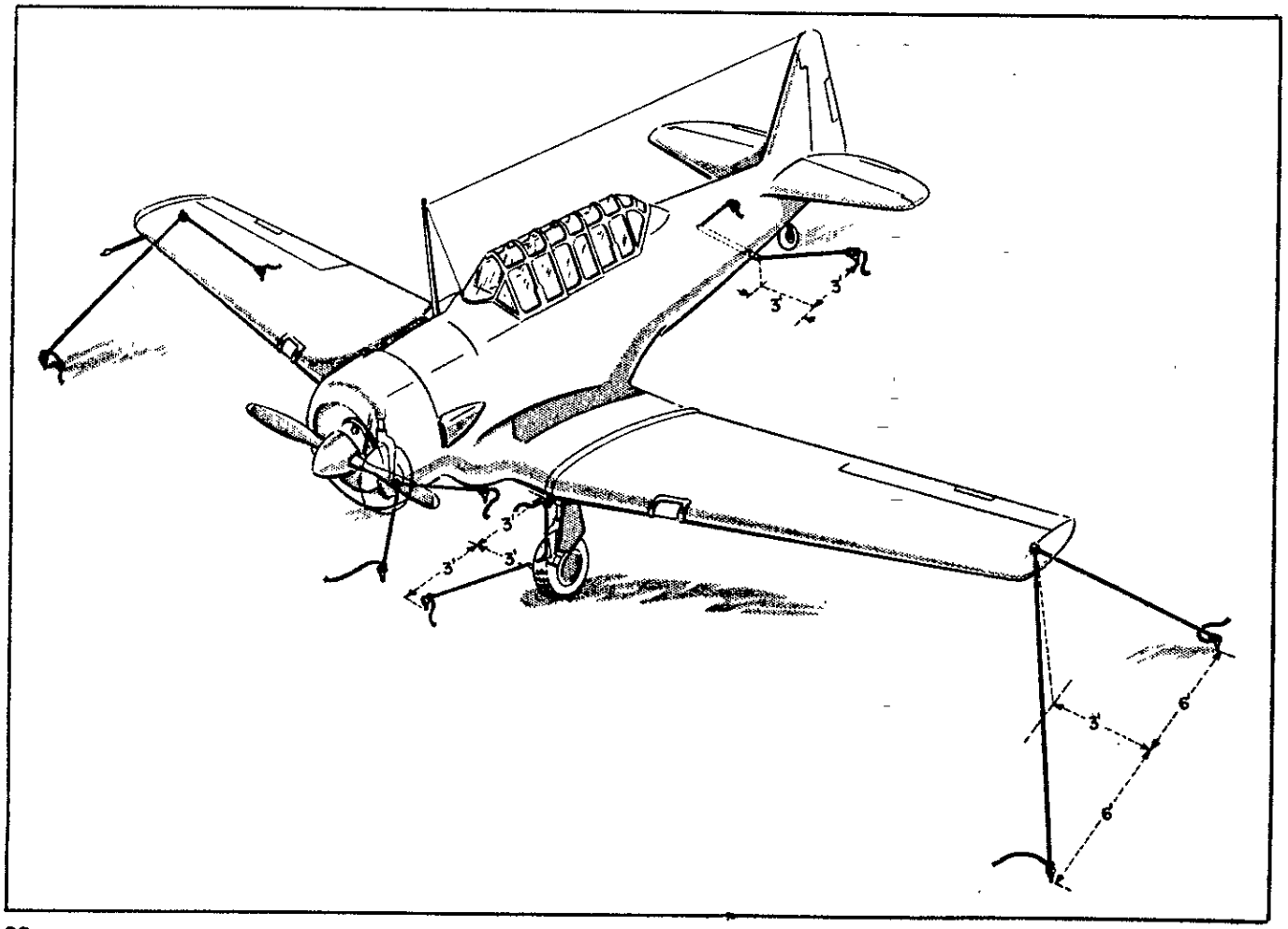


Figure 25 — Mooring Airplane

SECTION III
FLIGHT OPERATING DATA

1. POWER PLANT CHART.

a. Operating limitations and characteristics of the R-1340-AN-1 engine are summarized on the "Power Plant Chart". The pilot should be thoroughly familiar with this information.

b. Engine operating conditions shown on the chart are defined as follows:

(1) WAR EMERGENCY.—Not applicable.

(2) MILITARY POWER. — Maximum recommended for operation for periods not exceeding 5 minutes.

(3) NORMAL RATED.—Maximum recommended for operation with rich mixture in climb and level flight.

(4) MAXIMUM CRUISE. — Maximum recommended with lean mixture.

(5) TAKE-OFF CONDITIONS. — Maximum recommended for take-off under the specified time limit of 5 minutes.

2. AIR SPEED LIMITATIONS.

Refer to section II, paragraph 1.

3. AIR SPEED CORRECTION TABLE.

IAS MPH	CALIBRATED AIR-SPEED (MPH)	ALTIMETER ERROR ADD TO INSTRUMENT READING	
		S. L.	15,000
80	80	0	0
100	101	10	10
120	122.5	20	30
140	144	40	60
160	165.5	60	100
180	187	90	140
200	208.5	120	190
220	230		
240	251		

POWER PLANT CHART

AIRCRAFT MODEL(S)	PROPELLER(S)	ENGINE MODEL(S)
AT-6 SNJ	12D40	R-1340-AN-1

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.	COOLANT TEMP.	
DESIRED MAXIMUM	5-6 6	70-80 100	70 85		
MINIMUM IDLING	3 2	60 15			

MAXIMUM PERMISSIBLE DIVING RPM: 2800
MINIMUM RECOMMENDED CRUISE RPM: 1600
MAXIMUM RECOMMENDED TURBO RPM:

OIL GRADE: (S) 1120 (W) 1100
FUEL GRADE: 91/98 SPEC. AN-F-[illegible]

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
MINUTES			5 MINUTES			TIME LIMIT			UNLIMITED			UNLIMITED		
			260°C			MAX. CYL. HD. TEMP.			260°C			232°C		
			RICH			MIXTURE			RICH			LEAN		
			2250			R. P. M.			2200			2000		
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)
						-56.0	40,000 FT.	-67.0						
						-56.0	38,000 FT.	-67.0						
						-56.0	36,000 FT.	-67.0						
						-52.4	34,000 FT.	-62.3						
						-48.4	32,000 FT.	-55.1						
						-44.4	30,000 FT.	-48.0						
						-40.5	28,000 FT.	-40.9						
						-36.5	26,000 FT.	-33.7						
						-32.5	24,000 FT.	-26.5						
						-28.6	22,000 FT.	-19.4						
			F.T.		.5	-24.6	20,000 FT.	-12.3	F.T.		33	F.T.		25
			F.T.		.5	-20.7	18,000 FT.	- 5.2	F.T.		35	F.T.		27
			F.T.		.5	-16.7	16,000 FT.	2.0	F.T.		37	F.T.		29
			F.T.		.5	-12.7	14,000 FT.	9.1	F.T.		40	F.T.		31
			F.T.		1.0	- 8.8	12,000 FT.	16.2	F.T.		43	F.T.		33
			F.T.		1.0	- 4.8	10,000 FT.	23.4	F.T.		46	26.0		35
			F.T.		1.0	- 0.8	8,000 FT.	30.5	F.T.		49	26.5		35
			F.T.		1.0	3.1	6,000 FT.	37.6	F.T.		53	27.5		34
			F.T.		1.0	7.1	4,000 FT.	44.7	32.5		54	28.5		34
			35.0		1.0	11.0	2,000 FT.	51.8	32.5		52	29.0		34
			36.0		1.0	15.0	SEA LEVEL	59.0	32.5		49	30.0		34

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.
VALUES ARE FOR LEVEL FLIGHT WITH RAM.

FOR COMPLETE CRUISING DATA SEE APPENDIX I
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:	CONDITIONS TO AVOID:
2250 RPM AND 36" MG	*OPERATION BELOW 1500 RPM*

SPECIAL NOTES

1. *THE MIXTURE CONTROL IN THIS AIRPLANE IS NOT AUTOMATIC AND MUST BE ADJUSTED MANUALLY TO OBTAIN SMOOTH ENGINE OPERATION AND BEST RANGE.*

AAFMC-526
8-1-44

DATA AS OF *8-10-44* BASED ON *FLIGHT TESTS*

Figure 26—Power Plant Chart

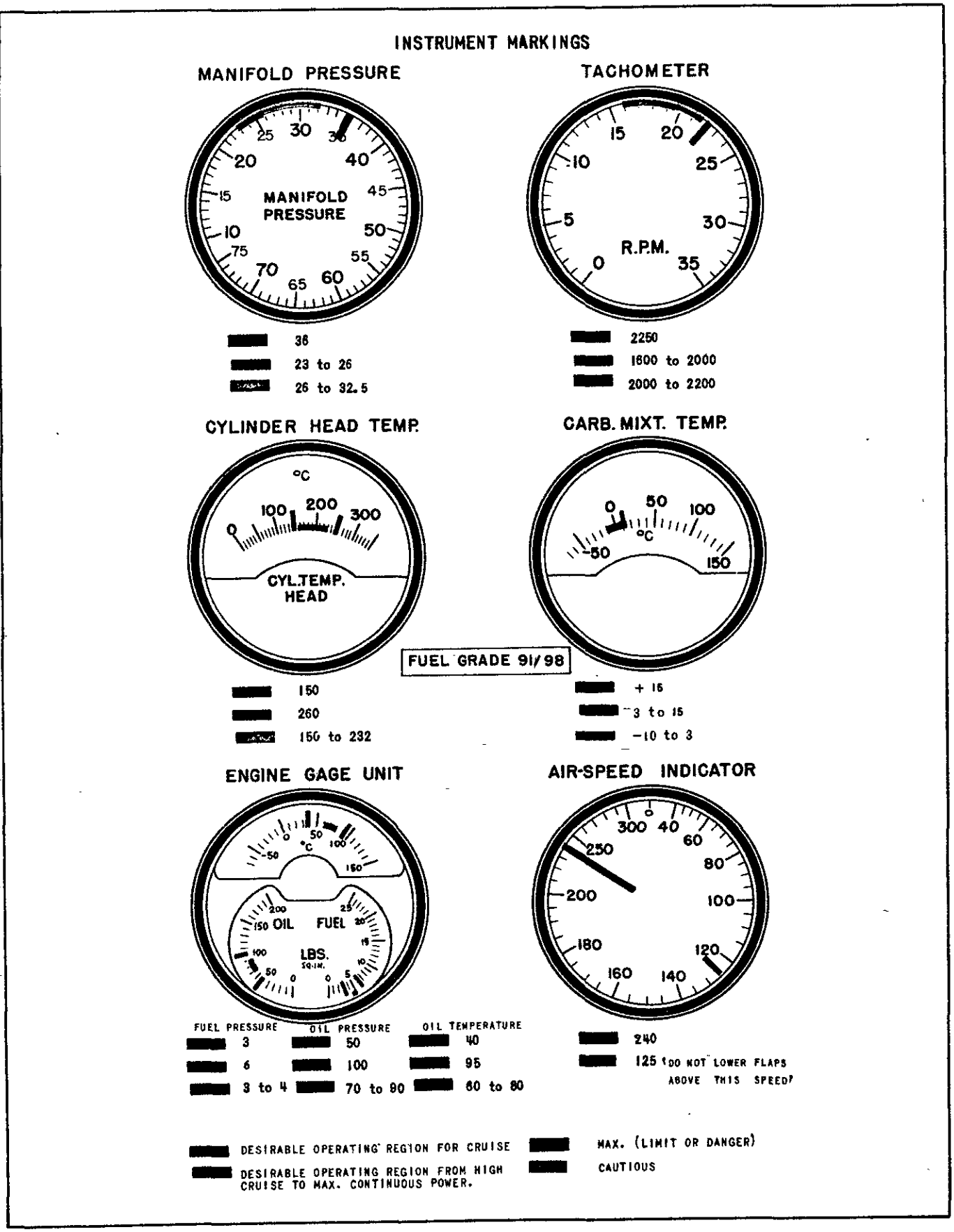


Figure 26A — Instrument Markings

(24B Blank)

SECTION IV
EMERGENCY OPERATING INSTRUCTIONS

1. GENERAL.

Emergency instructions have been assembled in this section to facilitate quick reference. The pilot should acquaint himself with these instructions before his first flight in this airplane.

2. SCRAMBLE TAKE-OFF

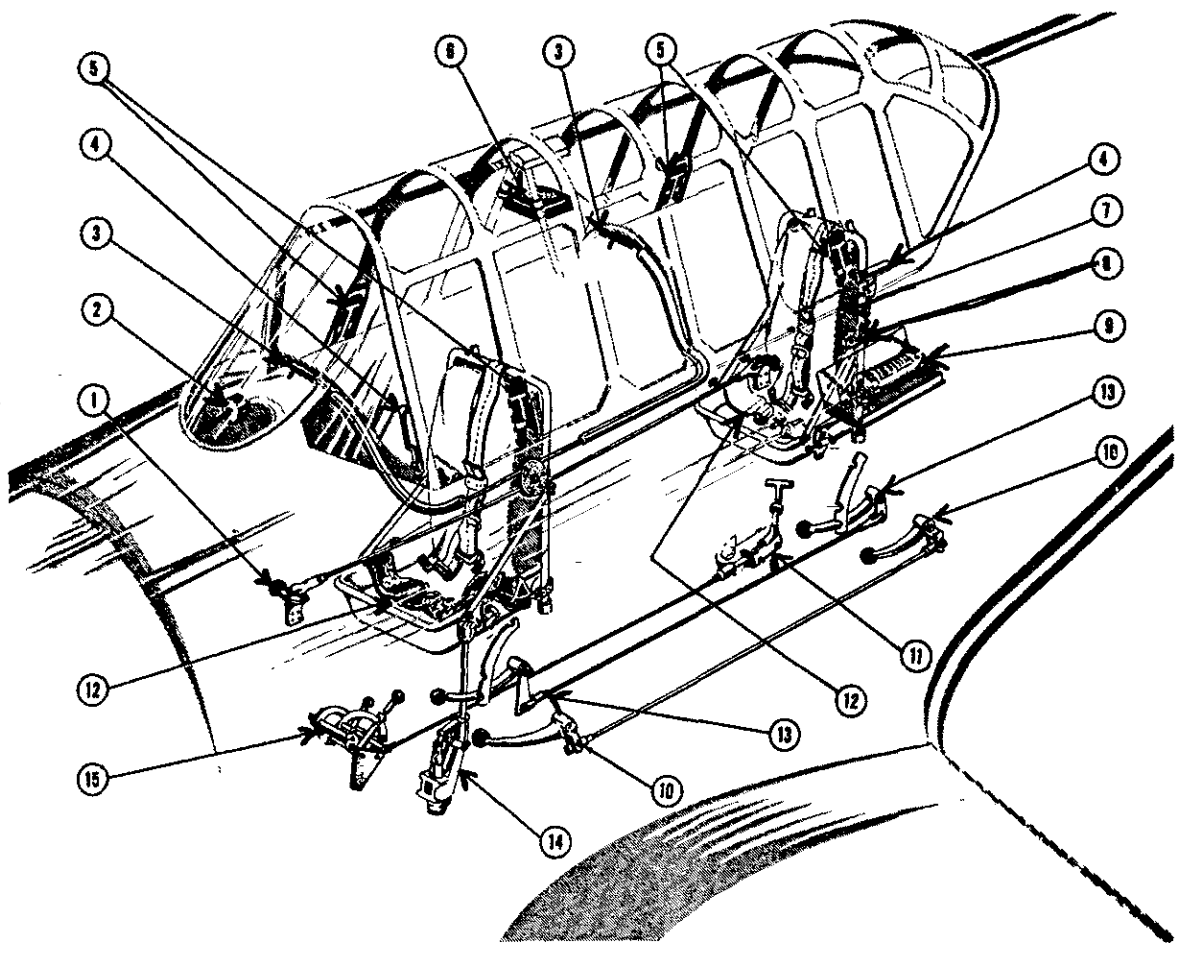
Refer to section II paragraph 6.

3. ENGINE FAILURE DURING TAKE-OFF.

Refer to section II, paragraph 9.

4. ENGINE FAILURE DURING FLIGHT.

If the engine fails during flight, the airplane may be abandoned, ditched, or brought in for a dead-stick landing. Maintain speed by depressing the nose at once, if necessary, so that the air speed does not drop below 95 IAS. Place propeller control in "DECREASE RPM" to reduce drag. Do not attempt sideslips or "S" turns below 2000 feet altitude. Lowering of the flaps may be de-



1. Instrument Flying Hood Release
2. Fuel Pressure Signal Lamp
3. Instrument Flying Hood Latch
4. Enclosure Latch
5. Emergency Escape Window Latch
6. Landing Gear Warning Horn
7. Life Preserver Cushion
8. Fire Extinguisher Door Lock
9. Fire Extinguisher
10. Hand Fuel Pump Handle
11. Rear Cockpit Bomb Salvo
12. Safety Belt
13. Landing Gear Control Handle (Emergency Lock Position)
14. Hydraulic Hand Pump
15. Front Cockpit Bomb Quadrant

Figure 27 — Emergency Provisions

layed until the last 300 or 400 feet, but keep in mind that once lowered, they can not be raised.

5. EMERGENCY EXIT DURING FLIGHT.

In the event that an emergency exit must be made during flight, the following procedures are recommended:

a. ENCLOSURE.—Release the sliding enclosure by pushing the lever on the left side of the section and pushing the enclosure back. Unfasten safety belt and shoulder harness, lower self onto wing and roll off, or roll airplane over on its back and drop out.

b. EMERGENCY ESCAPE WINDOW.—If the enclosure is inoperative, raise the red release lever at the bottom center of any side enclosure panel *(5 figure 27)*, thus breaking the safety wire, and push the panel clear of the airplane. This should permit the enclosure to be opened easily. As a last resort, exit through the side window opening.

c. INSTRUMENT BLIND-FLYING HOOD RELEASE.—The instrument flying hood may be released by the occupant of either cockpit.

(1) To release the hood of the adjoining cockpit, push the control knob *(1 figure 27)* on the forward left side of the cockpit.

(2) To release the occupied cockpit hood, push the same control knob or push the lever extending from the latch assembly *(3 figure 27)* located on the left below the edge of the instrument panel shield.

6. DITCHING.

WARNING

Be sure to ditch while fuel is still available for power.

The airplane should be ditched only as a last resort. On an overwater flight, if trouble arises and the pilot is certain that he will not be able to reach land, he should leave the airplane in flight. However, if it is not possible to maintain sufficient altitude for a successful parachute drop, ditching is the only remaining procedure. The instructions for ditching are as follows:

a. If bombs are installed, "SALVO" them immediately.

b. Lock the cockpit enclosure in the open position.

c. Landing gear "UP"

d. Flap 20 degrees.

e. Make certain that safety belt and shoulder harness are fastened securely, as there is a violent deceleration of the airplane upon final impact.

f Land fully stalled, tail low, with power if possible. In winds up to 40 MPH land parallel to the swells, in winds over 40 MPH land into the wind.

7. EMERGENCY LANDING.

In the event a forced landing is necessary, proceed as follows:

a. Depress the nose to maintain a minimum of 95 IAS.

b. "SALVO" bombs "UNARMED".

c. Keep landing gear retracted.

d. Check safety belt for security.

e. Use flaps so airplane will glide and land in accustomed manner.

f. Land as nearly upwind as possible.

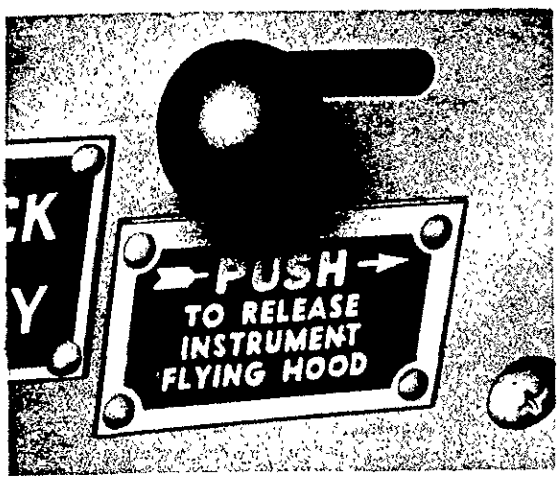
g. If power is available, use it to level airplane just before ground contact.

h. Turn "OFF" the ignition and battery-disconnect switches and fuel selector valve just before landing.

i. Immediately after landing, get clear of airplane.

8. EMERGENCY LOWERING OF FLAPS AND LANDING GEAR.

a. HYDRAULIC HAND PUMP OPERATION.—The hydraulic hand pump *(14 figure 27)* located to the



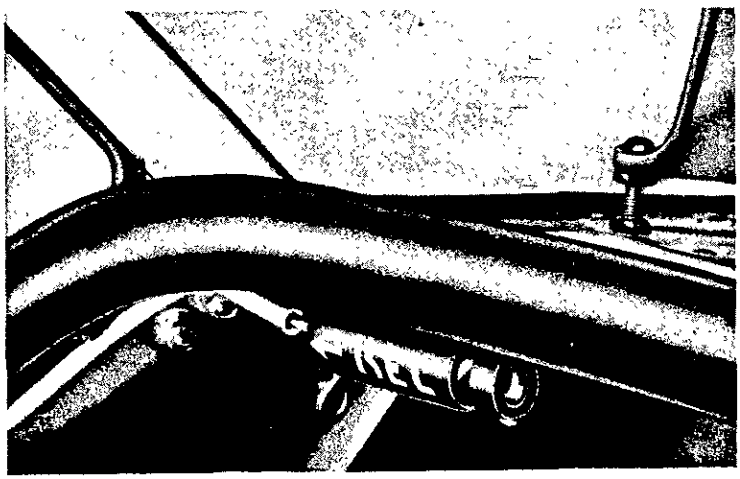


Figure 30—Instrument Flying Hood Release

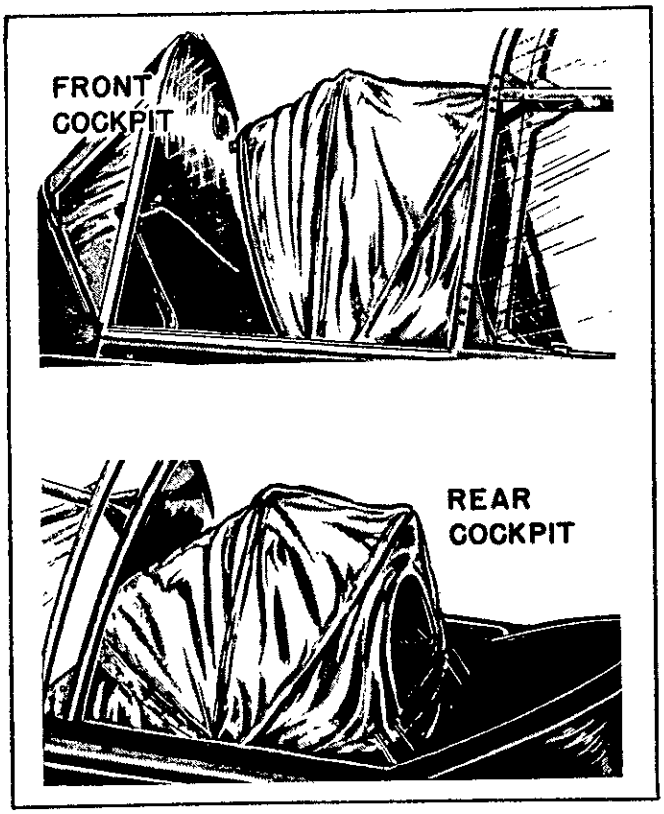


Figure 29 — Instrument Flying Hoods

left of the front cockpit seat is used in event of failure of the engine-driven hydraulic pump. It is not necessary to push the hydraulic power control lever. To operate:

(1) Place the landing gear or flap selector lever in the desired position.

(2) Raise the pump handle to the extended position; turn the pump handle clockwise until it locks, and start pumping.

b. COMPLETE HYDRAULIC FAILURE. — In the event of complete hydraulic system failure, the landing gear may be lowered by placing the landing gear control handle in the "DOWN" position and yawing the airplane. The force of gravity will pull the landing gear to the down position. Place the landing gear control in the "EMERGENCY" locking position *(13 figure 27)* when the indicator shows the gear fully extended. This will mechanically engage the down lockpins. Yaw the airplane again if difficulty in engaging the lockpins is encountered. Flaps cannot be operated in the event of complete hydraulic system failure.

9. ENGINE-DRIVEN FUEL PUMP FAILURE.

Maintain fuel pressure by use of the hand fuel pump *(10 figure 27)* on the control shelf of each cockpit in the event of engine fuel pump failure. Insufficient operation of the hand pump will be indicated by the fuel pressure warning light *(2 figure 27)*. Maintain 3 to 4 lb/sq in. pressure to supply sufficient fuel to the engine.

10. EMERGENCY BOMB RELEASE.

a. FRONT COCKPIT BOMB QUADRANT.

(1) In order to salvo unarmed, place the bomb safety and nose fuse switches to "SAFE". Move the bomb arming lever of the quadrant to "SAFE". *(See 15 figure 27.)*

(2) Move the release lever to "SALVO".

b. REAR COCKPIT BOMB SALVO. — Pull the emergency salvo handle *(11 figure 27)*. Bombs will drop either "ARMED" or "SAFE", according to the position of the switches on the front cockpit electrical control panel.

11. USE OF MISCELLANEOUS EMERGENCY EQUIPMENT.

a. FIRE EXTINGUISHER.—A carbon tetrachloride hand fire extinguisher is installed on the left side of the rear cockpit. *(See figure 30.)* A hinged door makes it accessible from outside also. To remove, release retaining strap buckle and pull outward. Pressing the red button the left fuselage side panel opens the access door.

b. LIFE PRESERVER.—The back cushion of both cockpit seats is filled with kapok and may be used as a life preserver.

c. PYROTECHNICS.—Provisions are made in early Group I airplanes for stowing a type M-2 pyrotechnic pistol at the right side of the front cockpit. Racks alongside are provided for three type M-10 and three type M-11 signals.

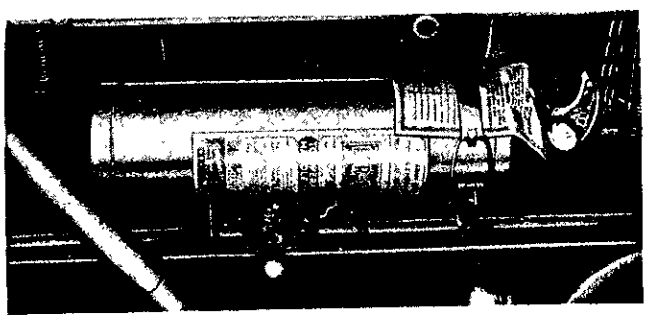
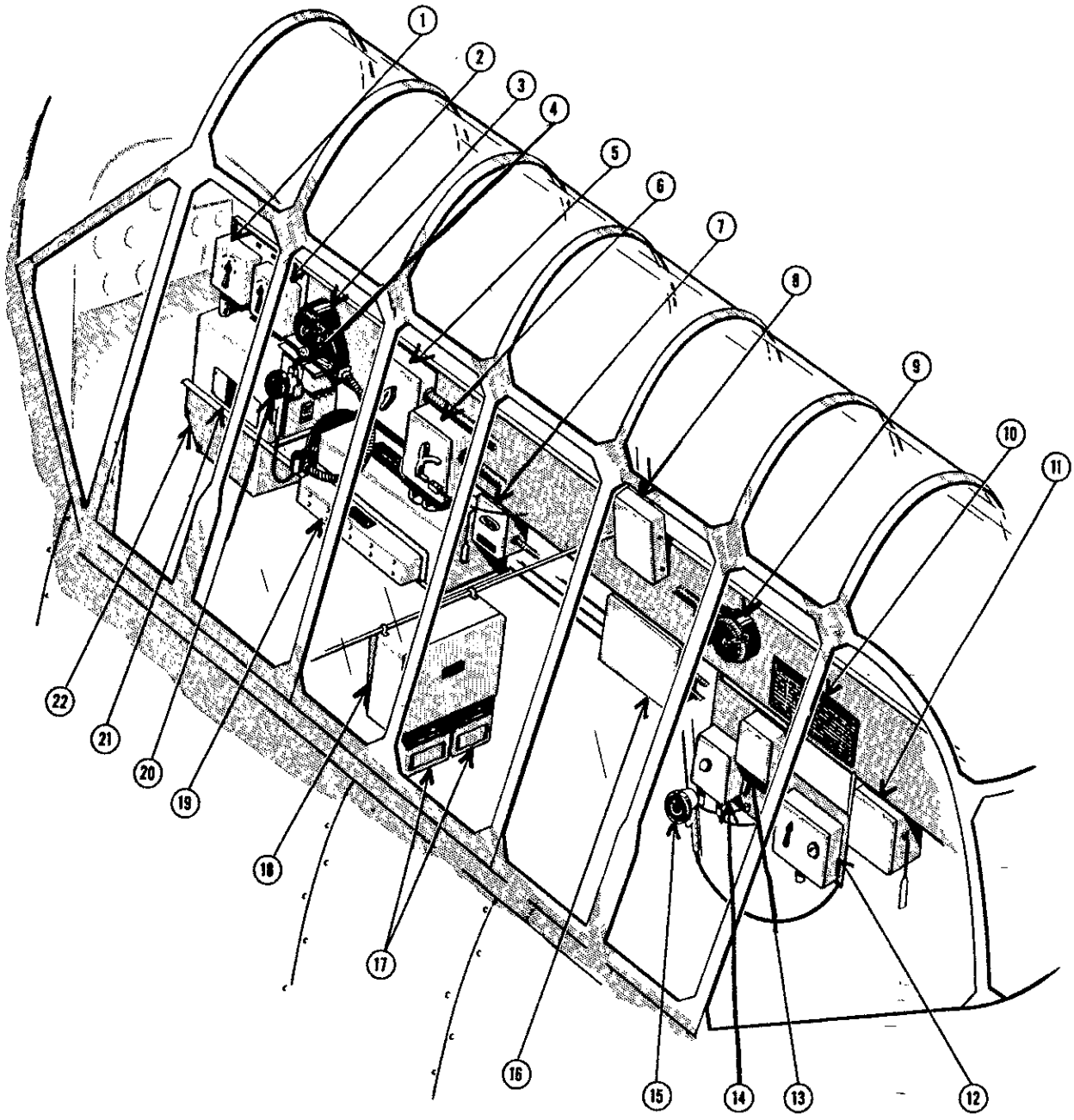


Figure 30 — Fire Extinguisher



1. Transmission Control Box
2. Receiver Control Box
3. Tuning Unit—Front Cockpit
4. Antenna Switching Relay
5. Filter Switch Box
6. Radio—Interphone Switch Box
7. Control Box (British Use)
8. Filter Unit
9. Tuning Unit—Rear Cockpit
10. Calibration Chart
11. Jack Box (British Use)
12. Receiver Control Unit
13. Interphone Control Unit
14. Interphone Box
15. Microphone—Rear Cockpit
16. Interphone Junction Box
17. Interphone Amplifiers
18. Command Set Junction Box
19. Receiver
20. Microphone—Front Cockpit
21. Transmitter
22. Command Set Pull Box

Figure 31 — Communication System

SECTION V
OPERATIONAL EQUIPMENT

1. COMMUNICATION EQUIPMENT.

a. DESCRIPTION. *(See figure 31.)*—The command set SCR-AL-183 installation consists of a transmitter (2500 to 7700 kc) and a receiver (201 to 398 kc and 2500 to 7700 kc), both of which are provided with extra coils and tuning arrangements to obtain the desired operating frequency. Duplicate controls are provided in each cockpit; however choice of reception and type of transmission is controlled from the front cockpit only. An interphone installation, RC-27, provides intercommunication between the two cockpits.

b. OPERATION. — Place the battery-disconnect switch in the "ON" position. To supply power to the communication equipment, place radio control switch *(6 figure 32)* at *"MANUAL"*.

(1) RECEPTION.

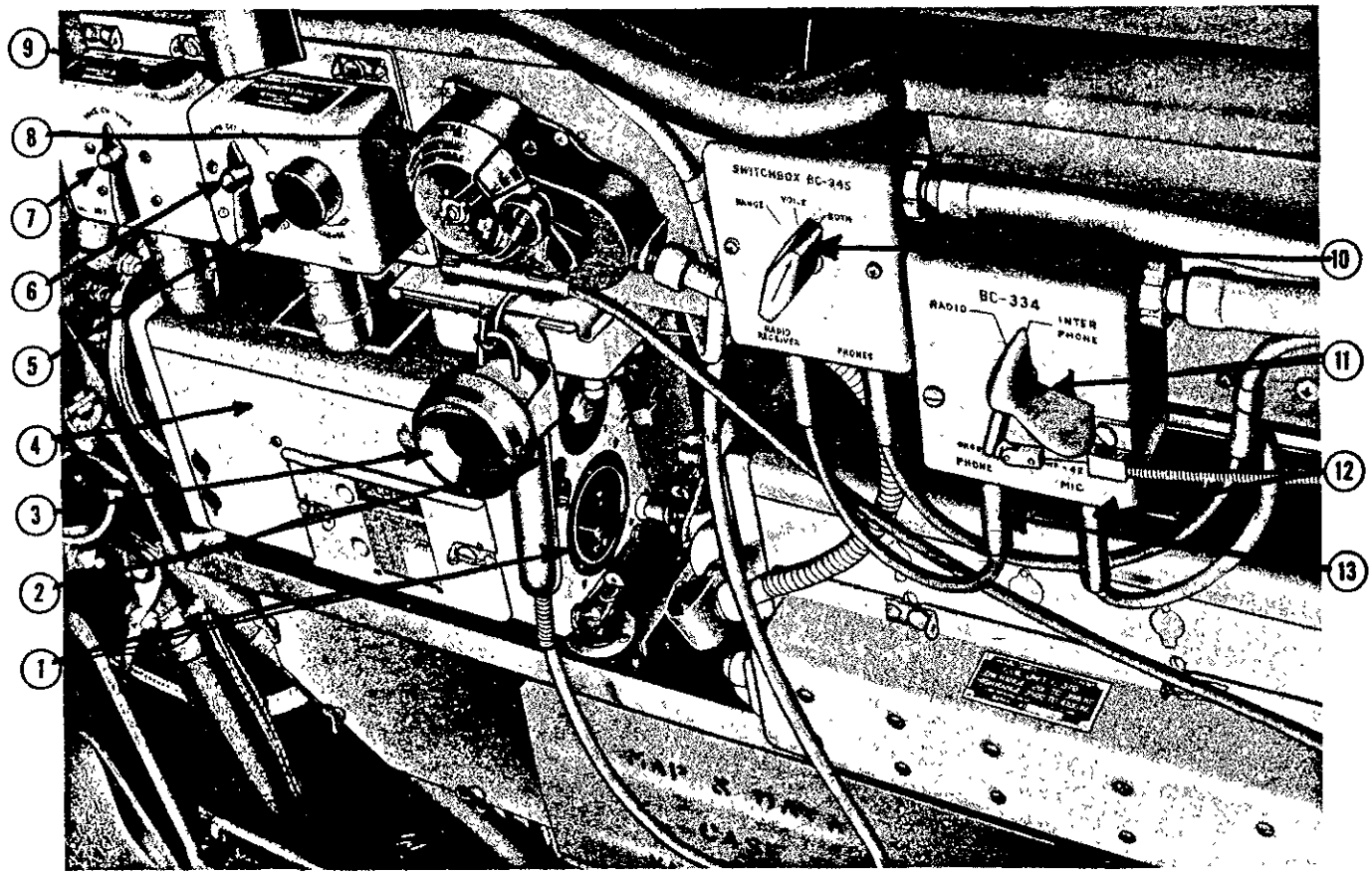
(a) Turn radio-interphone switch *(11 figure 32)* to "RADIO".

(b) Plug headphones into "PHONE" jack *(13 figure 32)*.

(c) Wait 45 seconds for receiver to warm. A hum will be heard in the phones.

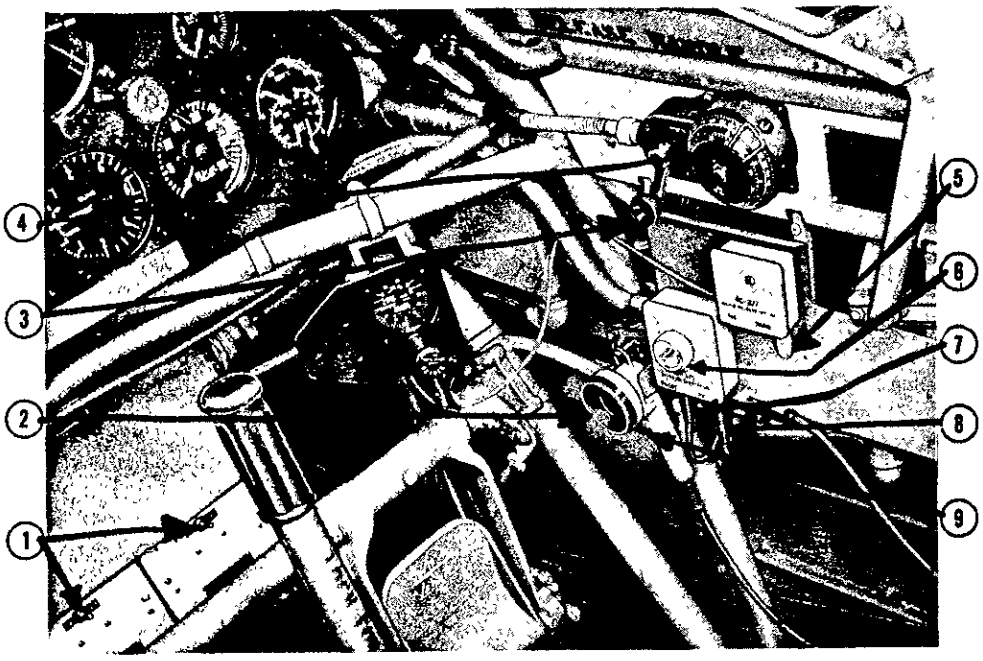
(d) Turn filter selection switch to "RANGE", "VOICE", or "BOTH", depending on type of reception desired. "BOTH" provides reception of "RANGE" and "VOICE" simultaneously.

(e) Use tuning unit *(8 figure 32)* to tune in desired station.



1. Antenna Current Meter
2. Microphone Switch
3. Microphone
4. Radio Transmitter
5. Volume Control
6. Radio Control Switch
7. Transmitter "VOICE-CW-TONE" Switch
8. Tuning Unit
9. Telegraph Key
10. Filter Selection Switch
11. Radio-Interphone Switch
12. Microphone Jack
13. Head Set Jack

Figure 32 — Radio Controls — Front Cockpit



1. Interphone Amplifier Switch
2. Microphone
3. Tuning Handle
4. Tuning Dial
5. Radio—Interphone Switch
6. Volume Control
7. Head Set Jack
8. Microphone Jack
9. Microphone Switch

Figure 33 — Radio Controls — Rear Cockpit

f. Use volume control *(5 figure 32)* to obtain desired volume.

(g) Turn control switch from "MANUAL" to "AUTO" for automatic gain control and adjust volume if necessary.

Note

Do not attempt to tune in signals with control switch in "AUTO" position.

(h) To turn off set, turn control switch to "OFF"

(2) TRANSMISSION.

(a) VOICE.

1. Place radio control switch at "MANUAL".

2. Plug microphone into jack marked "MIC." *(12 figure 32).*

3. Turn radio-interphone switch to "RADIO".

4. Turn selector switch to "VOICE".

5. Press microphone switch to talk. A click should be heard in the phones and the antenna circuit meter should register about .8 amperes.

Note

A throat microphone switch is located on each throttle control. Hand microphones are controlled by a switch on each microphone.

(b) KEY.

1. Place radio control switch *(6 figure 32)* at "MANUAL".

2. Turn radio-interphone switch *(11 figure 32)* to "RADIO".

3. Turn selector switch *(7 figure 32)* to "CW" or "TONE", according to the type of transmission desired.

4. Use key *(9 figure 32)* on top of transmitter control unit to send signal.

(3) INTERPHONE.

(a) Make certain the amplifier switch *(1 figure 33)* is "ON".

(b) Place radio-interphone switch to "INTERPHONE" and use microphone as in voice transmission.

c. PREFLIGHT CHECK.

(1) RECEPTION.

(a) Turn the receiver on.

(b) With engine not running, check reception to determine if stations are being received properly.

(c) With engine running check reception for undue electrical interference.

(2) TRANSMISSION.

(a) Set switches for voice transmission.

(b) Call the local control station or other air-

planes operating from the same base for frequency check and to determine if transmission and reception are satisfactory.

d. SIGNAL FAILURES.

(1) BETWEEN AIRPLANES. — Uninterrupted communication between maneuvering airplanes cannot be expected unless they are close together. Best reception is usually obtained with airplanes in level flight. Vertical banks cause minimum signal strength unless both airplanes bank the same direction. A "dead spot" will be present when the receiving airplane is directly above or below the radio mast of the transmitting airplane.

(2) AIRPLANE TO GROUND.—Usually signal fading (rapid variations) is encountered in proportion with the transmission distance; however it may be present at distances of less than 10 miles. Poor quality signals or reception do not necessarily indicate faulty equipment. Make a test at close range before looking for equipment trouble.

e. POST FLIGHT PROCEDURE.

(1) Throw radio control switch *(6 figure 32)* to "OFF".

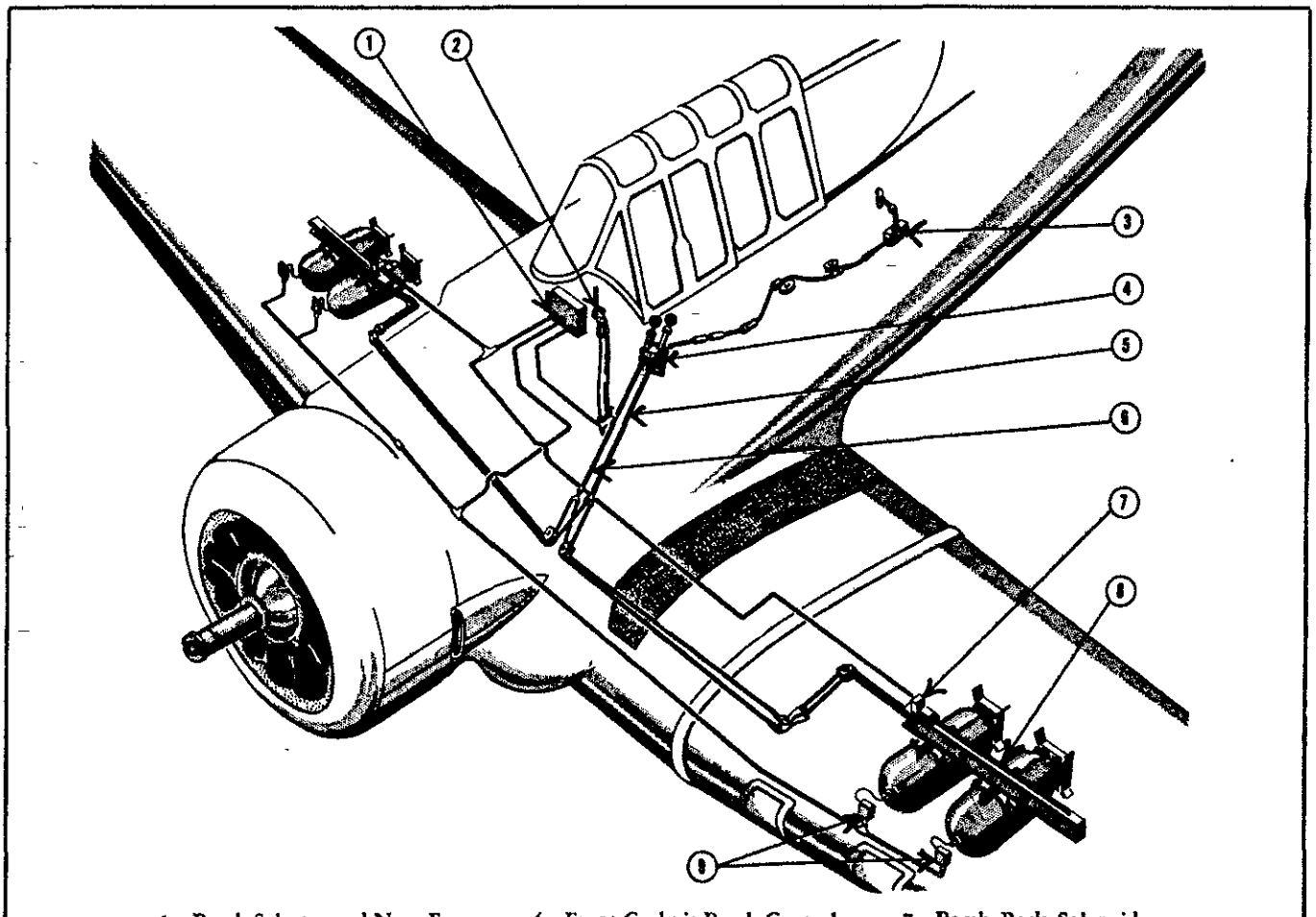
(2) Throw battery-disconnect switch to "OFF".

(3) Securely fasten all loose equipment, head sets, microphones, etc., in their proper places.

2. BOMBING EQUIPMENT.

a. DESCRIPTION.

(1) GENERAL. *(See figure 34.)*—Complete provisions have been incorporated in the airplane for a flush-type bomb rack and other bombing equipment on the lower surface of each outer wing panel. The bomb racks will carry five M-5, 30-pound fragmentation bombs or five M-41, 20-pound fragmentation bombs, either U.S. or British. Two auxiliary bomb shackles may be added to each of these racks for carrying a total of four Mark I, 100-pound bombs, either U.S. or British, in place of the smaller bombs.



1. Bomb Selector and Nose Fuse Switches
2. Bomb Release Switch
3. Rear Cockpit Salvo Release
4. Front Cockpit Bomb Control Quadrant
5. Arming Cable
6. Release Cable
7. Bomb Rack Solenoid
8. Bomb Rack
9. Nose Fusing Solenoids

Figure 34 — Bombing Equipment

(2) SWITCHES. *(See figure 37.)*—Electrical control switches, which consist of one "BOMB SAFETY" switch, two "BOMB SELECTOR" switches, and one "NOSE FUSE" switch, are grouped on the pilot's electrical control panel in the front cockpit.

(a) The "BOMB SAFETY" switch, when "OFF", prevents accidental electrical release of the bombs. The switch must be "ON" before any electrical release can be accomplished.

(b) The "BOMB SELECTOR" switches provide selection of the rack to be employed. "LEFT" or "RIGHT", or "LEFT" and "RIGHT" can be used as desired.

(c) The "NOSE FUSE" switch operates the four type B-1 bomb arming units to nose-arm the 100-pound bombs. A signal lamp, adjacent to this switch, will glow when the 100-pound bombs are nose-armed.

(3) RELEASE.—Release of the bombs, as selected, is accomplished by the push-button type thumb switch *(figure 35)* located on the top of the control stick in the front cockpit. Bombs may be dropped selectively by pushing the control stick release button consecutively. The bombs are released in a definite order, from inboard to outboard and simultaneously on both sides of the airplane when both racks are used together. The "BOMB SAFETY" switch circuits and the firing switch circuits on the control stick are protected from current overloads by two 50-ampere fuses in the main switch panel. Provisions are made for a bomb control quadrant *(figure 38)* on the control shelf on the left side of the front cockpit. This quadrant provides an arming and release handle, stamped "A" and "R", respectively. The arming handle will arm the 20- and 30-pound bombs at the nose, and the 100-pound bombs at the nose or the tail. Except for nose-arming the 100-pound bombs, all arming must be done through this arming handle. The release handle when at "LOCK" position locks the entire system and will prevent release, either electrically or manually, of all bombs. The handle must be moved to "SELECTIVE" position before electrical release can be accomplished. In moving the release handle to "SALVO", all bombs are dropped simultaneously, either in the "ARMED" or "SAFE" condition, according to the setting of the arming handle and the electrical toggle switches. Provision is also made for a release handle in the rear cockpit, beneath the control shelf on the left side, which will only "SALVO" all bombs.

CAUTION

This is for use in an emergency and will release bombs either in the "SAFE" or "ARMED" condition, according to the arming handle and the electrical toggle switches in the front cockpit.

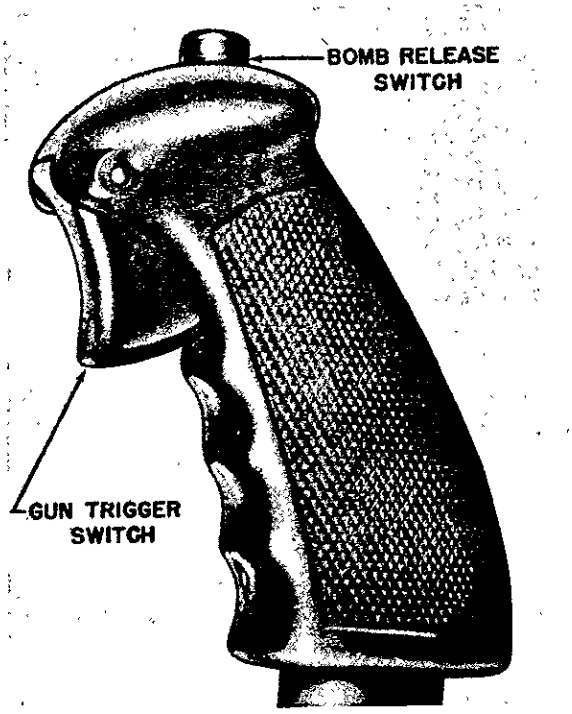


Figure 35—Gun and Bomb Control Switches

b. ARMING PROCEDURE.—Nose arming is accomplished by moving the bomb arming handle to the "ARMED" position and by moving the "NOSE FUSE" switch to the "ON" position. Tail arming is accomplished by moving the arming handle to the "ARMED" position.

(1) SELECTIVE RELEASE.—To drop bombs selectively, proceed as follows:

(a) Move the bomb release handle to the "SELECTIVE" position. The knob on the release handle must be depressed to release the handle for movement.

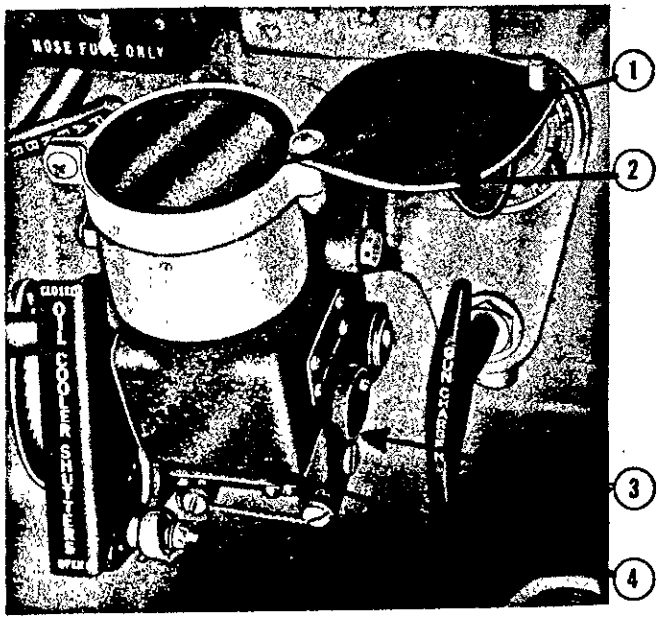
(b) Select the rack to be used by turning "ON" the "BOMB SELECTOR" switch.

(c) Place the "BOMB SAFETY" switch in the "ON" position.

(d) Press the bomb release button on the control stick to release the bomb or bombs. Bombs may be selected for alternate release from each side of the airplane by moving the left and right "BOMB SELECTOR" switches to "ON" and "OFF" alternately.

(2) SALVO RELEASE.—If all bombs are to be dropped simultaneously, proceed as follows:

(a) Press down on the knurled salvo safety ring, located half-way down the release handle, and turn it counterclockwise. This will allow the release handle to



1. Lens Assembly
2. Dust Shield
3. Adusting Knob
4. Sight Housing

Figure 36 — Gun Sight

be moved through the "SELECTIVE" position to the "SALVO" position.

(b) All bombs will drop simultaneously, either "ARMED" or "SAFE", depending on the setting of the arming handle and the position of the nose fuse switch.

(c) Pulling the release handle in the rear cockpit will "SALVO" bombs.

3. GUNNERY EQUIPMENT.

(See figures 35, 36, 37, and 39.)

a. DESCRIPTION.—Gunnery equipment consists of complete provisions for the installation and operation of three model M-2, .30-caliber machine guns: a fuselage gun synchronized to fire through the propeller arc, a gun mounted in the right outer wing panel, and a flexible gun in the rear cockpit. Two hundred rounds of ammunition are supplied each fixed gun from a box mounted adjacent to the gun. Five 100-round ammunition boxes are installed in the rear cockpit to supply the flexible gun. A type N-3B optical gun sight is mounted in the center, directly below the front instrument panel. Gun sight light intensity is controlled by a rheostat to decrease the intensity during night flying. Sight reticle adjustment is effected by a knurled knob on the right side of the sight assembly. Provisions are installed for a type W-7B camera to operate simultaneously with either or both fixed guns. Saftey switches for camera and gun solenoids are located on the front cockpit electrical control panel.

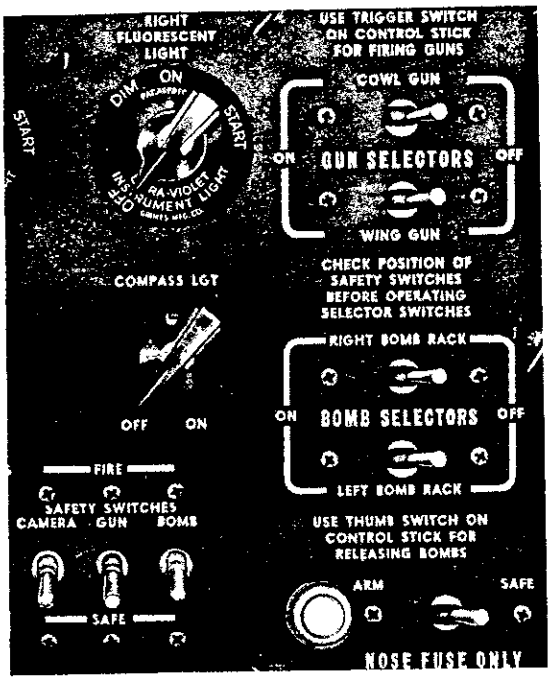
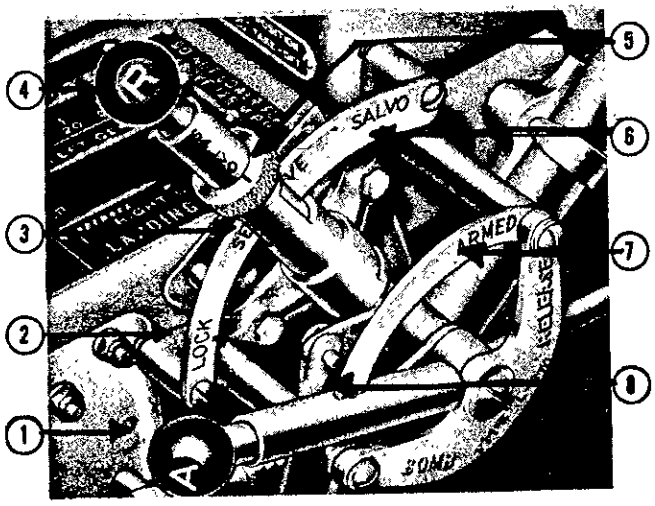
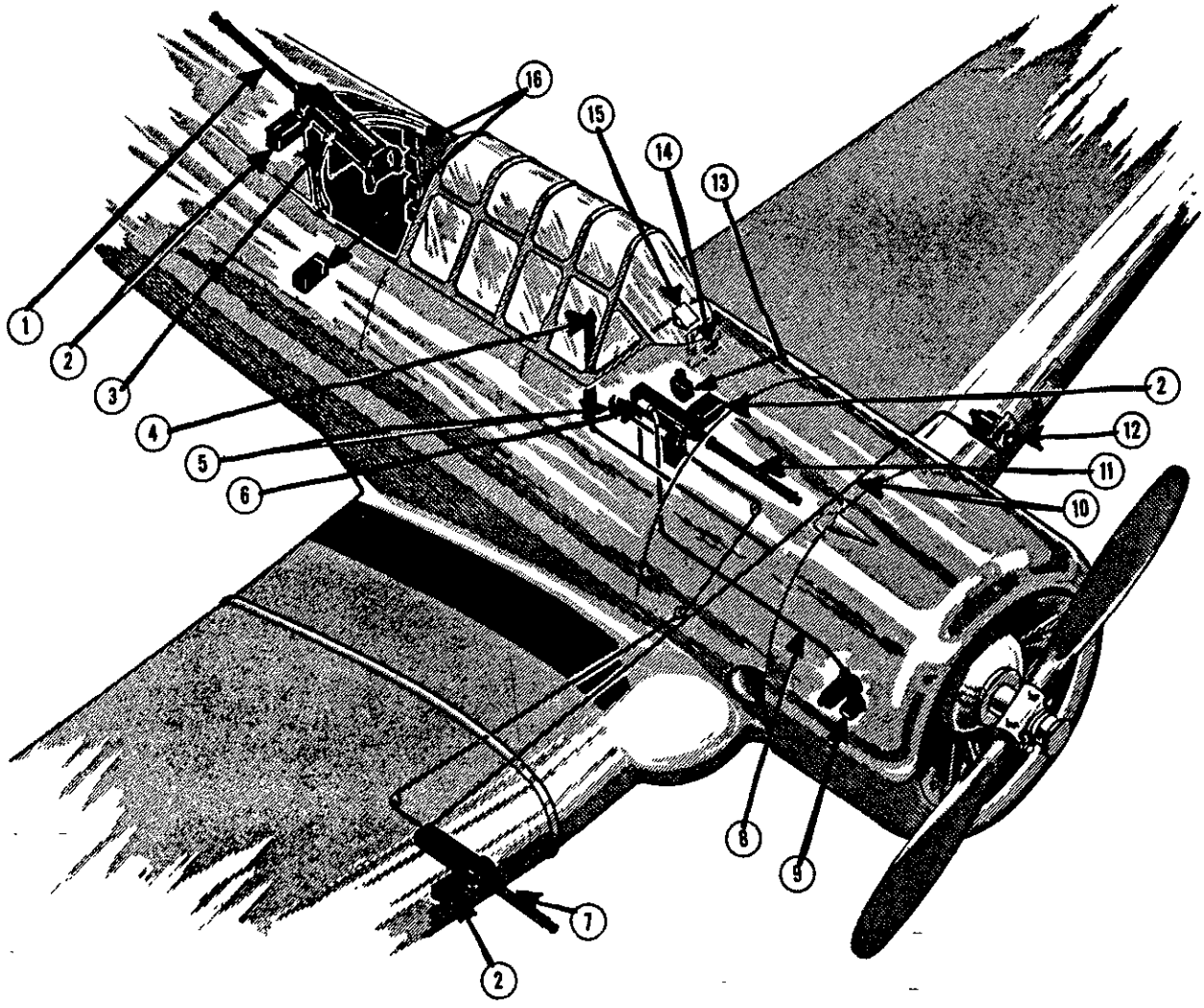


Figure 37 — Armament Control Switches



1. Arming Handle
2. "LOCK" Position
3. "SELECTIVE" Position
4. Release Handle
5. Salvo Safety Ring
6. "SALVO" Position
7. "ARMED" Position
8. "SAFE" Position

Figure 38 — Bomb Control Quadrant



1. Flexible Gun
2. Ammunition Boxes
3. Gun Mount Truck
4. Trigger Switch
5. Wing Gun Charger
6. Trigger Motor
7. Wing Gun
8. Impulse Cable
9. Fuselage Gun Synchronizer
10. Wing Gun and Camera Circuit
11. Fuselage Gun
12. Gun Camera
13. Gun Sight
14. Selector and Safety Switches
15. Gun Sight Reflector Plate
16. Ammunition Stowage Boxes

Figure 39 — Gunnery and Camera Installation

b. OPERATION.

(1) FIXED GUNS.

(a) Charge the fuselage gun by pulling back on the charging handle on the left side of the gun.

(b) Charge the wing gun on late airplanes by pulling back on the charging handle to the right of the gun sight. Wing guns on early airplanes are manually charged when serviced.

(c) Place the selector and safety switches "FIRE."

(d) Fire the guns by squeezing the trigger on the control stick grip.

Note

Put the rear control stick in the stowed position before rotating seat.

(2) FLEXIBLE GUN.

(a) Pull outward on the gun yoke locking knob.

(b) Pull up and back on the gun until the locking knob snaps into place.

(c) Raise the truck-locking handle to move the gun truck along the track.

(d) Lower the handle at the desired position.

(e) Pull back on the charging handle and then release it.

(f) To fire the gun, press the trigger on the hand grip.

4. PHOTOGRAPHIC EQUIPMENT.

a. GUN CAMERA. *(See figure 39.)*—Complete pro-

visions are installed for a type W-7B gun camera in the left outer-wing leading edge near the center sections. The camera is synchronized to fire with the wing or fuselage gun, or both, and is operated by the gun firing switch on the front cockpit control stick. A safety switch is located on the front cockpit electrical control panel. This switch must be in "FIRE" position before camera will operate.

b. AERIAL CAMERA.—Provisions are made for the installation and operation of a type K-3B or K-17 aerial camera and a type A-2 view finder. Controls for the camera consist of a type B-2 intervalometer, a vacuum selector valve, and two warning lights. The intervalometer governs the automatic operation of the camera and is provided with a control knob for setting exposures from 6 to 75 seconds apart. The vacuum selector valve is marked "ON" and "OFF". *(See figure 40.)* When "ON", vaccum holds the film to the focal plane contact glass. A signal light is located on the power junction box near the camera and on the upper front instrument panel to warn the pilot and cameraman 3 seconds before each exposure, when using the intervalometer. Camera doors are also provided below the camera mount in the rear fuselage. To open or close the camera doors, push down on the control handle located on the forward end of each door; then push or pull the handle quickly to engage the doors in an open or closed position, respectively.

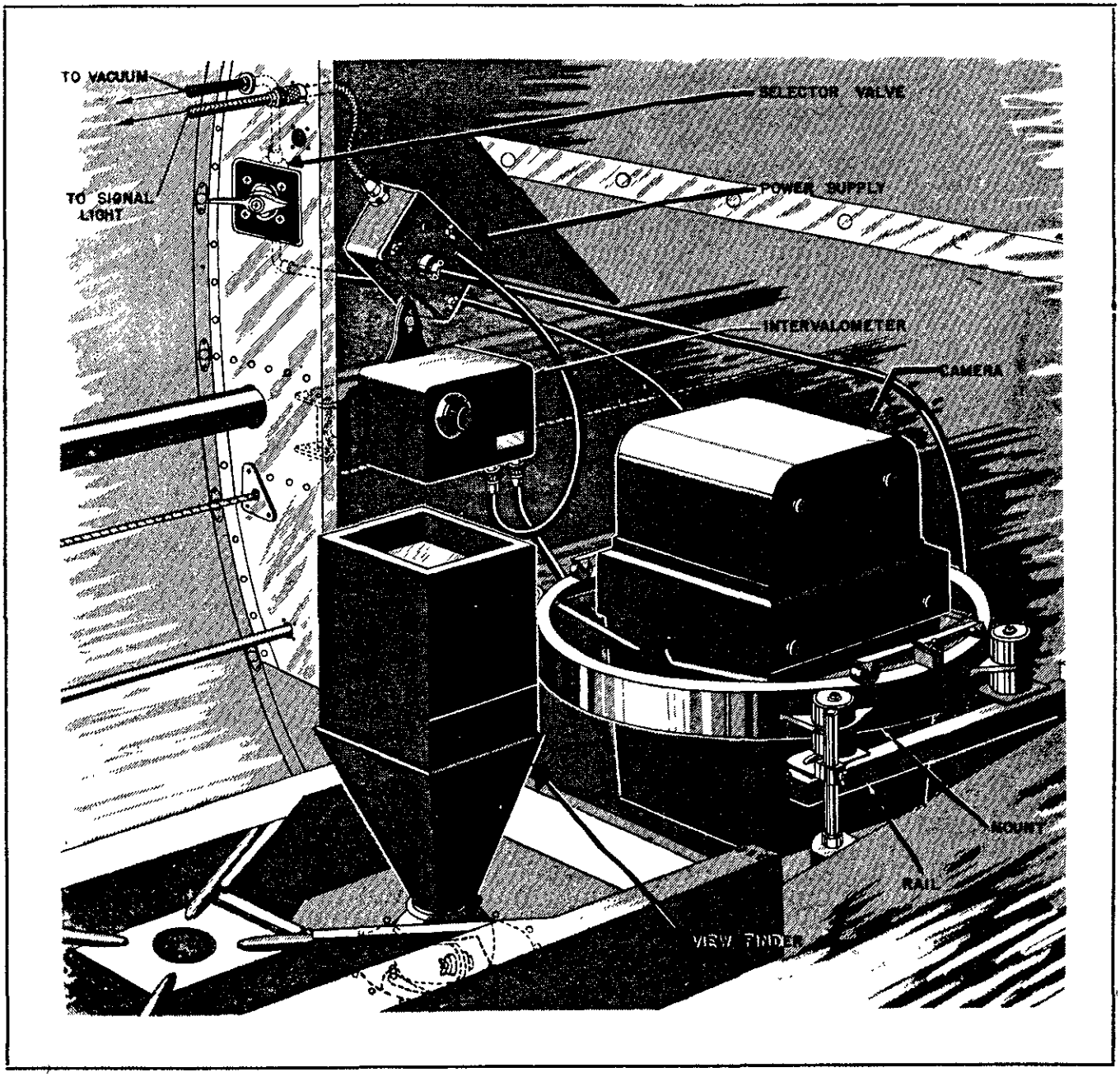


Figure 40 — Aerial Camera Controls

5. OXYGEN EQUIPMENT.

a. High Pressure Oxygen System.

(1) DESCRIPTION. *(See figure 41.)*—The high-pressure oxygen system consists of two type B-1 cylinders, two type A-8 regulators (with flow indicator and pressure gage), and the necessary tubing and fittings. The regulator units are installed on the right side of each cockpit. The front cockpit regulator is supplied oxygen by the right cylinder and the rear regulator by the left cylinder. Normal full pressure of each cylinder is 1800 lb/sq in.

(2) OPERATION.—Turning the regulator control knob is the only manual operation required in high-pressure oxygen systems. Quantity of oxygen supplied is determined by the position of this control. Open the control knob until the flow indicator reading corresponds with the altitude at which the airplane is flying.

(3) CONSUMPTION CHART.—The following table indicates the approximate supply of oxygen in man-hours at designated altitudes when the cylinders are fully charged.

Altitude (In Feet)	Oxygen Duration (Hours, 1 Man)
10,000	5.7
15,000	4.9
20,000	4.1
25,000	3.5

b. LOW PRESSURE OXYGEN SYSTEM.

(1) GENERAL.

(a) On some airplanes a low pressure oxygen system, supplied by one Type G-1 oxygen cylinder, is installed in the airplane. The oxygen cylinder is installed aft of the rear cockpit. The oxygen system may be refilled through a filler valve located on the aft wall in the baggage compartment. Only a demand oxygen mask will be used. The approximate oxygen duration for each crew member is given in Figure 41A.

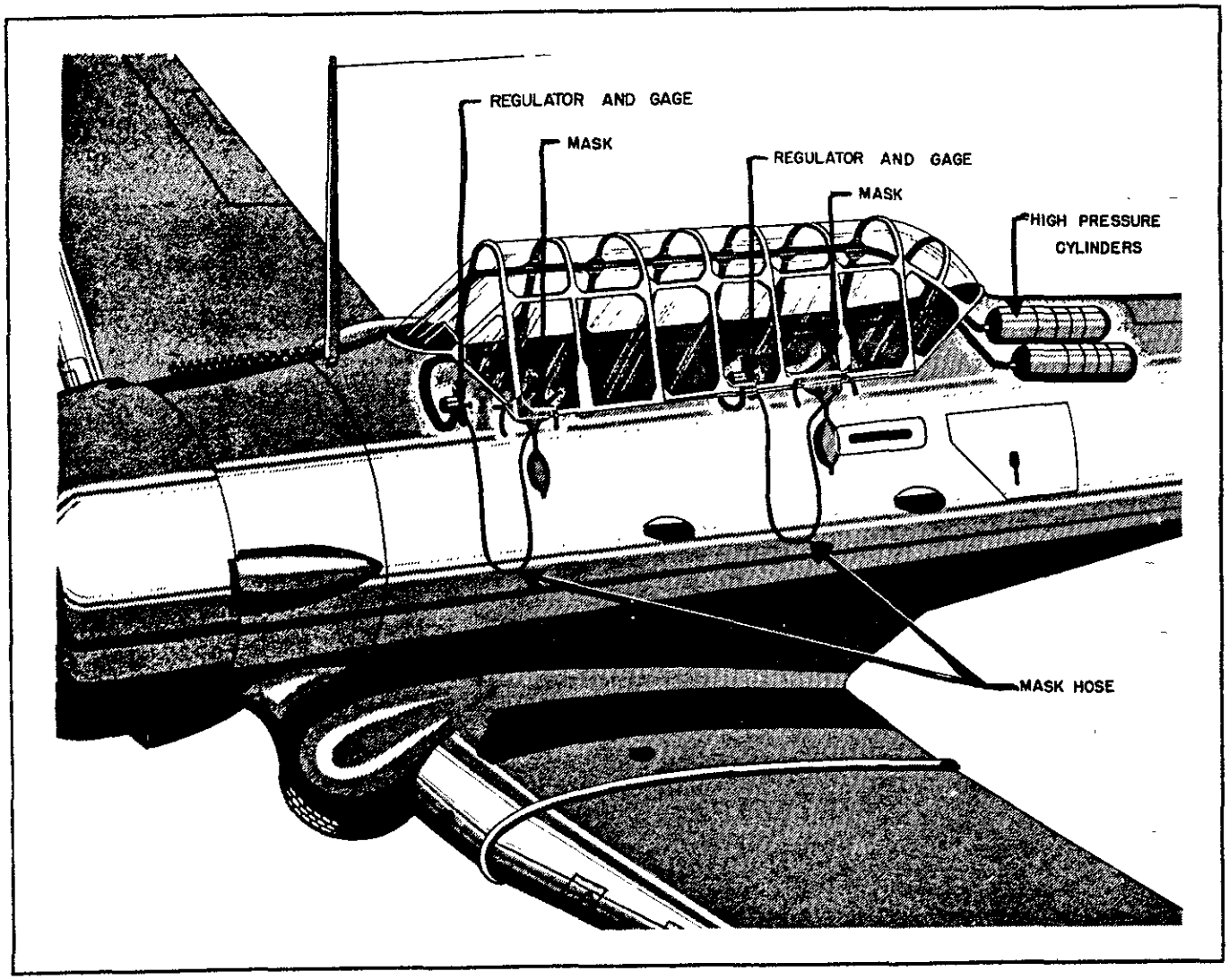


Figure 41 — High Pressure Oxygen System

(b) REGULATOR.—A diluter demand oxygen regulator is installed on the right side of each cockpit. The regulator automatically supplies a proper mixture of air and oxygen at all altitudes.

(2) CONTROLS.

(a) REGULATOR DILUTER LEVER. — A diluter lever is provided on each regulator to select "NORMAL OXYGEN" for all normal usage or to select "100% OXYGEN" for emergency use.

(b) REGULATOR EMERGENCY VALVE.—In event the oxygen regulator malfunctions a regulator emergency valve is provided. The emergency valve of the regulator is always safety-closed with wire and should only be opened in an emergency.

(3) INDICATORS.

(a) PRESSURE GAGE.—An oxygen pressure gage is mounted on the right side of each cockpit.

(b) FLOW INDICATOR.—A flow indicator is mounted on the right side of each cockpit.

(4) NORMAL OPERATION. — The regulator diluter lever should be set at the "NORMAL OXYGEN" position. The regulator emergency valve should be safety-wired closed.

(5) EMERGENCY OPERATION.—With symptoms of the onset of anoxia, or if smoke or fuel fumes should enter the cabin, set the diluter lever of the regulator to "100% OXYGEN." If the oxygen regulator should become inoperative, open the emergency valve by turning the red emergency knob counterclockwise.

CAUTION

When use of "100% OXYGEN" or EMERGENCY" becomes necessary, the pilot will be informed of this action. Use of "100% OXYGEN" or "EMERGENCY" will reduce oxygen duration of the airplane. After the emergency is over, set the diluter lever to "NORMAL OXYGEN" and close the emergency valve.

T-6C

CREW MEMBER OXYGEN DURATION - HOURS

CABIN ALTITUDE - FEET	GAGE PRESSURE - PSI							
	400	350	300	250	200	150	BELOW 100	Emergency - Descend to Altitude Not Requiring Oxygen
25,000	1.8 2.1	1.5 1.8	1.3 1.5	1.0 1.2	0.8 0.9	0.5 0.6	0.3 0.3	
20,000	1.4 2.4	1.2 2.0	1.0 1.7	0.8 1.3	0.6 1.0	0.4 0.7	0.2 0.3	
15,000	1.1 2.9	1.0 2.4	0.8 2.0	0.6 1.6	0.5 1.2	0.3 0.8	0.2 0.4	
10,000	1.0 3.8	0.8 3.3	0.7 2.7	0.5 2.2	0.4 1.6	0.3 1.1	0.1 0.5	

Black Figures Indicate Diluter Lever "NORMAL"
Red Figures Indicate Diluter Lever "100%"
Cylinders: 1 Type G-1
Crew: 2

Figure 41A — Low Pressure Oxygen System Duration Table

APPENDIX I

FLIGHT OPERATING CHARTS

1. FLIGHT PLANNING.

a. GENERAL.

(1) A series of charts on the following pages is provided to aid in selecting the proper power and altitude to be used for obtaining optimum range of the airplane. Charts are provided for each airplane configuration with the probable ranges of gross weights.

(2) If the flight plan calls for a continuous flight where the desired cruising power and air speed are reasonably constant after take-off and climb and the external load items are the same throughout the flight, the fuel required and flight time may be computed as a single section flight. If this is not the case, the flight may be broken up into sections, and each leg of the flight planned separately, since dropping of external bombs causes considerable changes in range and air speed for given power. (Within the limits of the airplane, the fuel required and flying time for a given mission depend largely upon the speed desired. With all other factors remaining equal in an airplane, speed is obtained at a sacrifice of range, and range is obtained at a sacrifice of speed.)

b. USE OF CHARTS.

(1) Although instructions for their use are shown on the "Flight Operation Instruction Charts", the following expanded information on proper use of the charts may be helpful.

(2) Select the "Flight Operation Instruction Chart" for the model airplane, gross weight, and external loading to be used at take-off. The amount of gasoline available for flight planning purposes depends upon the reserve required and the amount required for starting and warm-up. Reserve should be based on the type of mission, terrain over which the flight is to be made, and weather conditions. The fuel required for climb and time to climb to various altitudes is shown on the "Take-Off, Climb, and Landing Chart". Fuel remaining after subtracting reserve, warm-up, and climb fuel from total amount available is the amount to be used for flight planning.

(3) Select a figure in the fuel column in the upper section of the chart equal to, or the next entry less than, the amount of fuel available for flight planning. Move horizontally to the right or left and select a figure equal to, or the next entry greater than, the distance (with no wind) to be flown. Operating values contained in the lower section of the column number in which this figure appears represent the highest cruising speeds possible at the range desired. It will be noted that the ranges listed in column I are figured for the altitude which gives the least miles per gallon. The ranges shown in column II and other columns to the right of column II can be obtained at any of the altitudes listed in the Altitude column. All of the power settings listed in a column will give approximately the same number of miles per gallon if each is used at the altitude shown on the same horizontal line with it. Note that the time required for the flight may be shortened by selection of the higher altitudes. The flight duration may be obtained by dividing the true air speed of the flight altitude into the air miles to be flown.

(4) The flight plan may be readily changed at any time en route, and the chart will show the balance of range available at various cruising powers by following the "Instructions for Using Chart" printed on each chart.

Note

The above instructions and following charts do not take into account the effect of wind. Adjustments to range values and flight duration to allow for wind may be made by any method familiar to the pilot, such as by the use of a flight calculator or a navigator's triangle of velocities.

c. SAMPLE PROBLEM.

(1) To fly 450 miles at a cruising altitude of 9000 feet with a take-off weight of 5500 pounds and no external load, the flight should be planned as follows:

(a) The fuel used for take-off and climb to 9000 feet is 15 gallons (using the data listed under 10,000 feet). Adding to this fuel the amount for landing and reserve (15 gallons) makes a total of 30 gallons not available for cruising. Thus there are 81 gallons for cruising (111—30=81).

(b) The range shown in column IV for 80 gallons is 470 miles or approximately 20 miles reserve.

(c) Vertically below in the table and opposite 10,000 feet (since 9000 feet is not listed) read 1800 rpm, full throttle, 180 mph true speed, and a fuel flow of 30 gph with the mixture in lean operation. Range to be traveled divided by true air speed equals the hours of flight (450÷180=2.5 hours). Hours multiplied by fuel flow equals the gallons used (2.5×30=75 gallons). Thus the fuel reserve is 81 less 75 or 6 gallons.

(2) As an alternate plan, reference to column V for maximum range at the extreme right of chart shows that the flight may be made with a sacrifice of 30 mph speed if more reserve is desired. The operating conditions in this case are 1600 rpm, 23 in. Hg manifold pressure, 155 mph true air speed at 23 gph fuel consumption. Under this plan, the time required will be 2.9 hours and the fuel used will be 67 gallons. Thus the time required will be .4 of an hour longer than (1) and will leave 8 gallons more for reserve.

(3) If arrival over a check point is late, because of head winds, reference to the charts and calculations will allow the pilot while in flight to select new cruising conditions for safe arrival at his destination.

AAFAC-557 4-1-46

AIRCRAFT MODEL(S)

AT-6
SNJ

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S)

R-1340-AN-1

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.
6000	0	0	1000	1700	1300	2000	1500	2400	1100	1800	1400	2200	1600	2500	1300	2100	1700	2500	2100	3000
	17	15	700	1200	800	1400	1000	1700	700	1300	900	1500	1100	1800	900	1400	1100	1700	1400	2100
	34	30	500	800	500	900	600	1100	400	800	500	1000	700	1200	500	900	600	1100	800	1400
	51	45	200	500	200	600	300	700	200	500	300	600	400	700	200	500	300	700	500	800
5500	0	0	900	1500	1000	1800	1300	2000	900	1600	1100	1800	1400	2100	1100	1700	1400	2100	1700	2500
	17	15	500	1000	700	1200	800	1400	600	1100	700	1300	900	1500	700	1200	900	1400	1100	1700
	34	30	300	700	400	800	500	900	300	700	400	800	500	1000	400	700	500	900	700	1100
	51	45	100	400	200	500	300	600	200	400	200	500	300	600	200	400	200	500	300	700

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

OPTIMUM TAKE-OFF WITH 2250 RPM. 36 IN.MG. & DEG.FLAP IS 80% OF CHART VALUES

DATA AS OF 8-10-46 BASED ON: FLIGHT TESTS

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 ____ FEET BEST I.A.S. MPH	AT ____ FEET BEST I.A.S. KTS	AT ____ FEET RATE OF CLIMB F.P.M.	AT ____ FEET FROM SEA LEVEL TIME MIN.	AT ____ FEET FROM SEA LEVEL FUEL USED
6000	115	100	1050	8	115	100	1100	5.0	12	115	100	800	10.0	16	110	95	500	18.0	21	105	90	200	32	28					
5500	115	100	1150	8	115	100	1200	4.5	12	115	100	900	9.0	15	110	95	550	16.0	20	105	90	250	29	26					

POWER PLANT SETTINGS: (DETAILS ON FIG. 26 SECTION III):

DATA AS OF 8-10-46 BASED ON: FLIGHT TESTS

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	HARD DRY SURFACE AT SEA LEVEL TO CLEAR 50' OBJ.	HARD DRY SURFACE AT 3000 FEET GROUND ROLL	HARD DRY SURFACE AT 3000 FEET TO CLEAR 50' OBJ.	HARD DRY SURFACE AT 6000 FEET GROUND ROLL	HARD DRY SURFACE AT 6000 FEET TO CLEAR 50' OBJ.	FIRM DRY SOD AT SEA LEVEL GROUND ROLL	FIRM DRY SOD AT SEA LEVEL TO CLEAR 50' OBJ.	FIRM DRY SOD AT 3000 FEET GROUND ROLL	FIRM DRY SOD AT 3000 FEET TO CLEAR 50' OBJ.	FIRM DRY SOD AT 6000 FEET GROUND ROLL	FIRM DRY SOD AT 6000 FEET TO CLEAR 50' OBJ.	WET OR SLIPPERY AT SEA LEVEL GROUND ROLL	WET OR SLIPPERY AT SEA LEVEL TO CLEAR 50' OBJ.	WET OR SLIPPERY AT 3000 FEET GROUND ROLL	WET OR SLIPPERY AT 3000 FEET TO CLEAR 50' OBJ.	WET OR SLIPPERY AT 6000 FEET GROUND ROLL	WET OR SLIPPERY AT 6000 FEET TO CLEAR 50' OBJ.
5500	100	87	100	87	700	1600	800	1700	900	1800	800	1700	900	1800	1000	1900	1800	2700	2000	2900	2200	3100
5000					700	1500	700	1600	900	1700	700	1600	800	1700	900	1800	1600	2500	1800	2600	2000	2800

DATA AS OF 8-10-46 BASED ON: FLIGHT TESTS

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 42—Take-off, Climb, and Landing Chart

AAFTC-520 6-1-44

AIRCRAFT MODEL(S)
AT-6
SNJ
ENGINE(S): R-1340-AN-1

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 5600 TO 4500 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING:

LIMITS	RPM.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.			SINGLE SPEED				
MILITARY POWER	2250	36		RICH	5 MIN.	260	65

FOR DETAILS SEE POWER PLANT CHART (FIG. 2 & SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN (1) EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING. MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) AND MIXTURE SETTING REQUIRED.

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V GIVE PROGRESSIVE INCREASE IN RANGE AT A SACRIFICE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. *RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).* (1) TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING (1)								
350	*300*	111 100	450	*390*	520	*450*	590	*510*	111 100	670	*580*
310 280 240	*270* *240* *210*	90 80 70	410 360 320	*350* *310* *270*	470 410 360	*400* *360* *310*	530 470 410	*460* *410* *360*	90 80 70	600 530 470	*520* *460* *400*
210 170 140	*180* *150* *120*	60 50 40	270 230 180	*230* *200* *180*	310 260 210	*270* *220* *180*	350 290 230	*300* *250* *200*	60 50 40	400 330 270	*350* *290* *230*
100 70 30	*90* *60* *30*	30 20 10	130 90 40	*120* *80* *40*	150 100 50	*130* *90* *40*	170 120 60	*150* *100* *50*	30 20 10	200 130 60	*170* *110* *80*

MAXIMUM CONTINUOUS						PRESS ALT. FEET	4.55 STAT. (3.95 NAUT.) MI./GAL.						5.2 STAT. (4.5 NAUT.) MI./GAL.						(5.9 STAT. (5.15 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
2200	F.T.	RICH	41	190	165	25000 20000 15000							2000	F.T.	RICH	36	185	160	2000	F.T.	LEAN	32	185	160	25000 20000 15000	1700	F.T.	LEAN	25	165	145
2200	F.T.	RICH	48	200	175	10000	2050	F.T.	RICH	42	195	170	2000	F.T.	LEAN	37	190	165	1800	F.T.	LEAN	30	180	155	10000	1600	23	LEAN	23	155	135
2200	F.T.	RICH	58	205	180	5000	1950	30	RICH	42	190	165	2000	28	LEAN	36	185	160	1600	29	LEAN	29	170	145	5000	1600	24	LEAN	22	145	125
2200	F.T.	RICH	51	190	165	S.L.	1950	31	RICH	40	180	155	2000	30	LEAN	34	175	150	1600	30	LEAN	27	155	135	S.L.	1600	25	LEAN	20	130	115

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 42) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) THE MIXTURE CONTROL IN THIS AIRPLANE IS NOT AUTOMATIC AND MUST BE ADJUSTED MANUALLY TO OBTAIN SMOOTH ENGINE OPERATION AND BEST RANGE.

EXAMPLE

AT 5500 LB. GROSS WEIGHT WITH 76 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 35 GAL.) TO FLY 430 STAT. AIRMILES AT 15,000 FT. ALTITUDE. MAINTAIN 2000 RPM AND F.T. IN. MANIFOLD PRESSURE WITH MIXTURE SET: LEAN.

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
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-10-44 BASED ON: *FLIGHT TESTS*

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

Figure 43 (Sheet 1 of 2 Sheets)—Flight Operation Instruction Chart

AAFHC-520 6-1-44

AIRCRAFT MODEL(S)
AT-6
SNJ
ENGINE(S): R-1340-AN-1

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 6000 TO 5000 POUNDS

EXTERNAL LOAD ITEMS
WING BOMBS

NUMBER OF ENGINES OPERATING: 1

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.			SINGLE SPEED				
MILITARY POWER	2250	36		RICH	5 MIN.	260	85

FOR DETAILS SEE POWER PLANT CHART (FIG. 2A 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).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
340	300	111 100	430	380	500	430	550	480	111 100	620	540
310 270 240	270 240 210	90 80 70	390 350 300	340 300 260	450 400 350	380 350 300	500 440 390	430 380 340	90 80 70	560 490 430	480 430 370
200 170 130	180 150 120	60 50 40	260 220 170	220 190 150	300 250 200	260 220 170	330 270 220	290 240 190	60 50 40	370 310 250	320 270 210
100 70 30	90 60 30	30 20 10	130 80 40	110 70 30	150 100 50	130 80 40	160 110 50	140 90 50	30 20 10	180 120 60	160 100 50

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(4.35 STAT. (3.8 NAUT.) MI./GAL.)						(5.05 STAT. (4.35 NAUT.) MI./GAL.)						(5.55 STAT. (4.8 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE (2)	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
2200	F.T.	RICH	91	185	160	25000 20000 15000							2000	F.T.	RICH	36	175	155	2000	F.T.	LEAN	32	175	155	25000 20000 15000	1750	F.T.	LEAN	25	165	135
2200	F.T-	RICH	98	195	170	10000	2050	F.T.	RICH	93	190	165	2000	F.T.	LEAN	37	185	160	1800	F.T.	LEAN	32	175	155	10000	1600	24	LEAN	24	150	130
2200	F.T.	RICH	58	200	175	5000	1900	30	RICH	93	185	160	2000	29	LEAN	36	180	155	1650	28	LEAN	30	165	145	5000	1600	25	LEAN	22	135	120
2200	32.5	RICH	51	185	160	S.L.	1950	31	RICH	91	175	150	1900	30	LEAN	24	170	145	1600	31	LEAN	28	155	135	S.L.	1600	26	LEAN	20	125	110

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 42) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) THE MIXTURE CONTROL IN THIS AIRPLANE IS NOT AUTOMATIC AND MUST BE ADJUSTED MANUALLY TO OBTAIN SMOOTH ENGINE OPERATION AND BEST RANGE.

EXAMPLE

AT 6000 LB. GROSS WEIGHT WITH 75 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 36 GAL.) TO FLY 950 STAT. AIRMILES AT 15,000 FT. ALTITUDE MAINTAIN 1750 RPM AND F.T. IN. MANIFOLD PRESSURE WITH MIXTURE SET: LEAN.

LEGEND

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

DATA AS OF 8-10-44 BASED ON: FLIGHT TEST

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

Figure 43 (Sheet 2 of 2 Sheets)—Flight Operation Instruction Chart

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