RESTRICTED

AN 01-25AD-1

Pilot's Handbook

for

NAVY MODELS

SB2C-5 • SBW-5

Airplanes

NOTE: THIS PUBLICATION SUPERSEDES AN 01-25AD-1 DATED 1 JULY 1945

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15 November 1945

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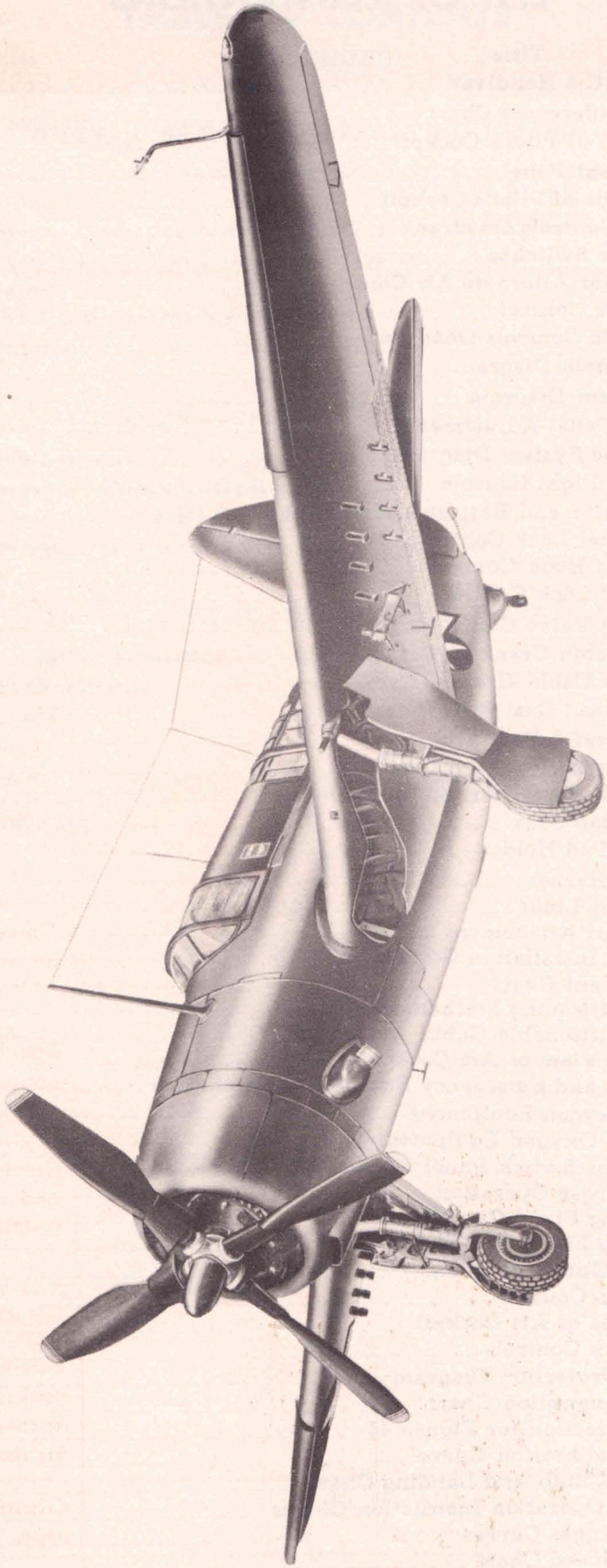
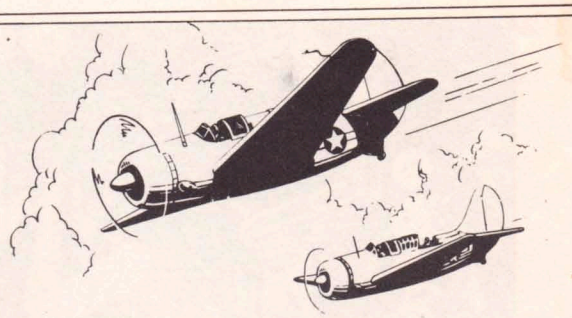


SB2C-5 Helldiver

Description
SECTION · I



ITEM	SB2C-3	SB2C-4	SB2C-5
Gross Weight	15086	15236	15563
Weight Empty	10408	10472	10762
C.G. (gross wt. only)	A.L.E. 34.1" or 30.9% MAC.	A.L.E. 33.4" or 30.2% MAC.	A.L.E. 34.9" or 31.5% MAC.
Armament (maximum load)	2—20mm. fixed cannon 1—Twin 30 flex. mount 2—1000# A.P. bombs (fuselage) & 2—500# bombs (wings), or 1—2000# torpedo (with adapter) or 1—2000# bomb (with adapter)	Same as SB2C-3	Same as SB2C-4, except: 2—1000# A.P. bombs (fuselage) & 2 1000# bombs (wings); fuselage bomb area increased to accommodate 2000# bomb without adapter; torpedo adapter redesigned for faster installation.
Fuel (gallons)	320	320	355
Oil (gallons)	25	25	37
Wing flaps		Perforated flaps added.	Outer panel flaps inoperative when launching rockets.
Armor plate	Large plate added aft of pilot's seat.	Armor plate added to speed ring.	Speed ring plate removed; optional armor installation provisions for pilot's floor.
Forward enclosure	"Flush" type replaced by "lap" type.	Same as SB2C-3.	Cross members removed and clear canopy installed.
Aft enclosure	"Flush" type replaced by "lap" type.	Same as SB2C-3.	Kick-out panel added to left side.
Arresting hook			External latch & new cockpit control added; access doors relocated for dashpot servicing.
Pilot's cockpit			Converted to console type.

Figure 2— Major Differences Chart

Parts list for figure 3.

1. Ignition switch
2. Propeller governor control
3. Mixture control
4. Friction Knob
5. Engine Controls Quadrant
6. Bomb doors control
7. Throttle
8. Supercharger control
9. Propeller toggle switch
10. Wing fold valve control
11. Wing fold lock control
12. Carburetor alternate air control
13. Oil cooler flaps position indicator
14. Auto pilot oil pressure gage
15. Left gun charger
16. Armament master switch
17. Gun camera switch
18. System accumulator air pressure gage
19. Brake accumulator air pressure gage
20. Mark III station distributor
21. Manual bomb release lever
22. Propeller circuit breaker button
23. Fuel selector for valve control
24. Bomb release quadrant
25. Auto pilot control valve
26. Wing flaps control
27. Landing gear control
28. Landing gear control lock
29. Oil cooler flaps control
30. Cowl flaps control
31. Hydraulic controls quadrant
32. Rocket flaps switch
33. Auxiliary fuel pump switch
34. Droppable wing tanks selector switch
35. Aileron trim tab control
36. Tail wheel lock control
37. Elevator trim tab control
38. Tow target release
39. Rudder trim tab control

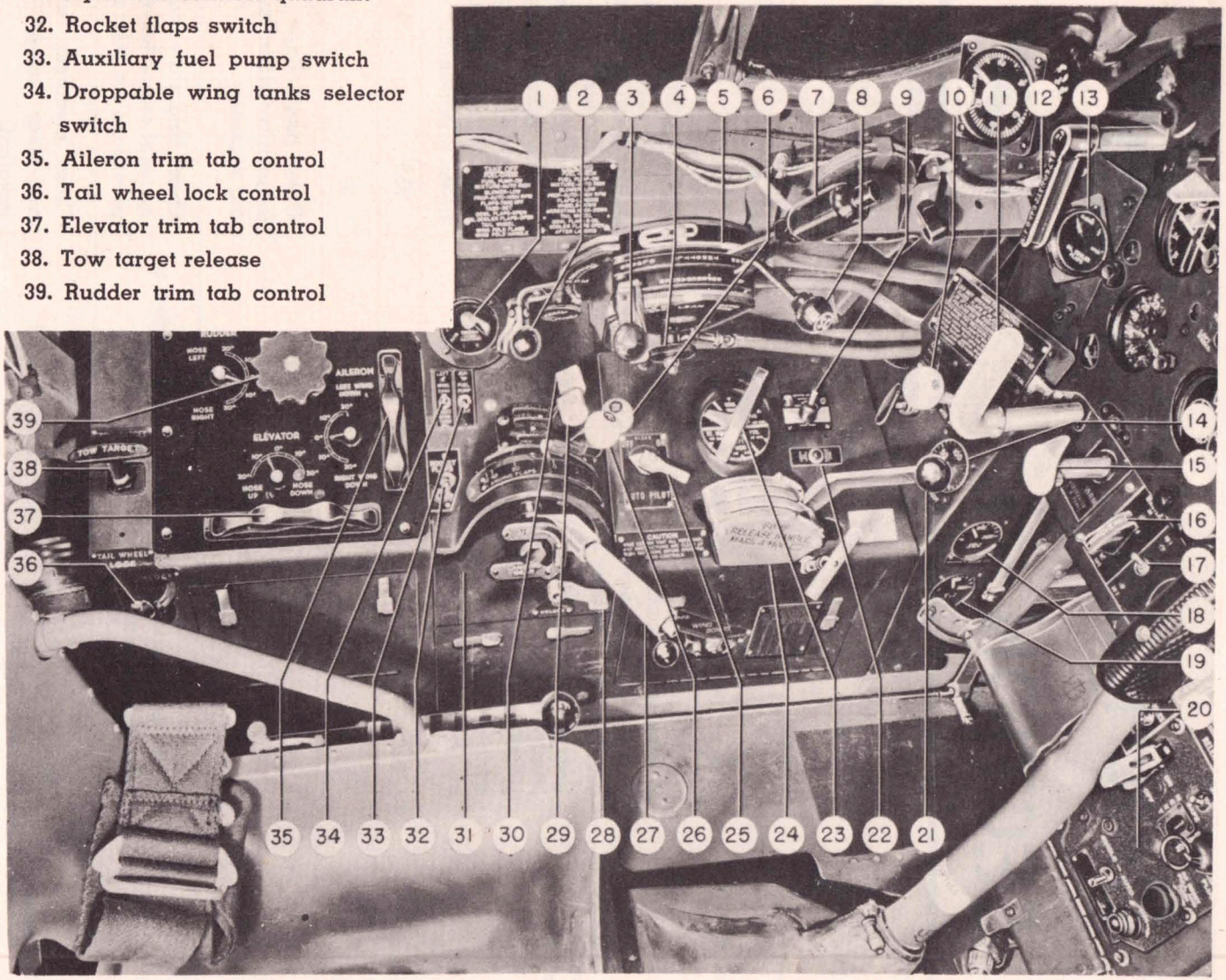


Figure 3—Left Side of Pilot's Cockpit

(The bomb release quadrant, Item 24, will not be found on SB2C-5 airplanes of Bureau number 83373 and subsequent)

Parts list for figure 4

1. Compass
2. Radio altimeter warning light
3. Altimeter
4. Airspeed indicator
5. Directional gyro
6. Free air temperature gage
7. Attitude gyro
8. Cylinder head temperature gage
9. Gun sight
10. Rate of climb indicator
11. Turn and bank indicator
12. Tachometer
13. Air filter control
14. Accelerometer
15. Oxygen flow indicator
16. Main switch panel
17. Lights switch panel
18. Manifold pressure gage
19. Circuit breaker switch panel
20. Engine gage unit
21. Fuel quantity gage
22. Mark III station distributor
23. Intervalometer
24. Bank and climb gyro
25. Landing gear indicator lights and switch
26. Armament switch panel
27. Radio altimeter
28. Clock

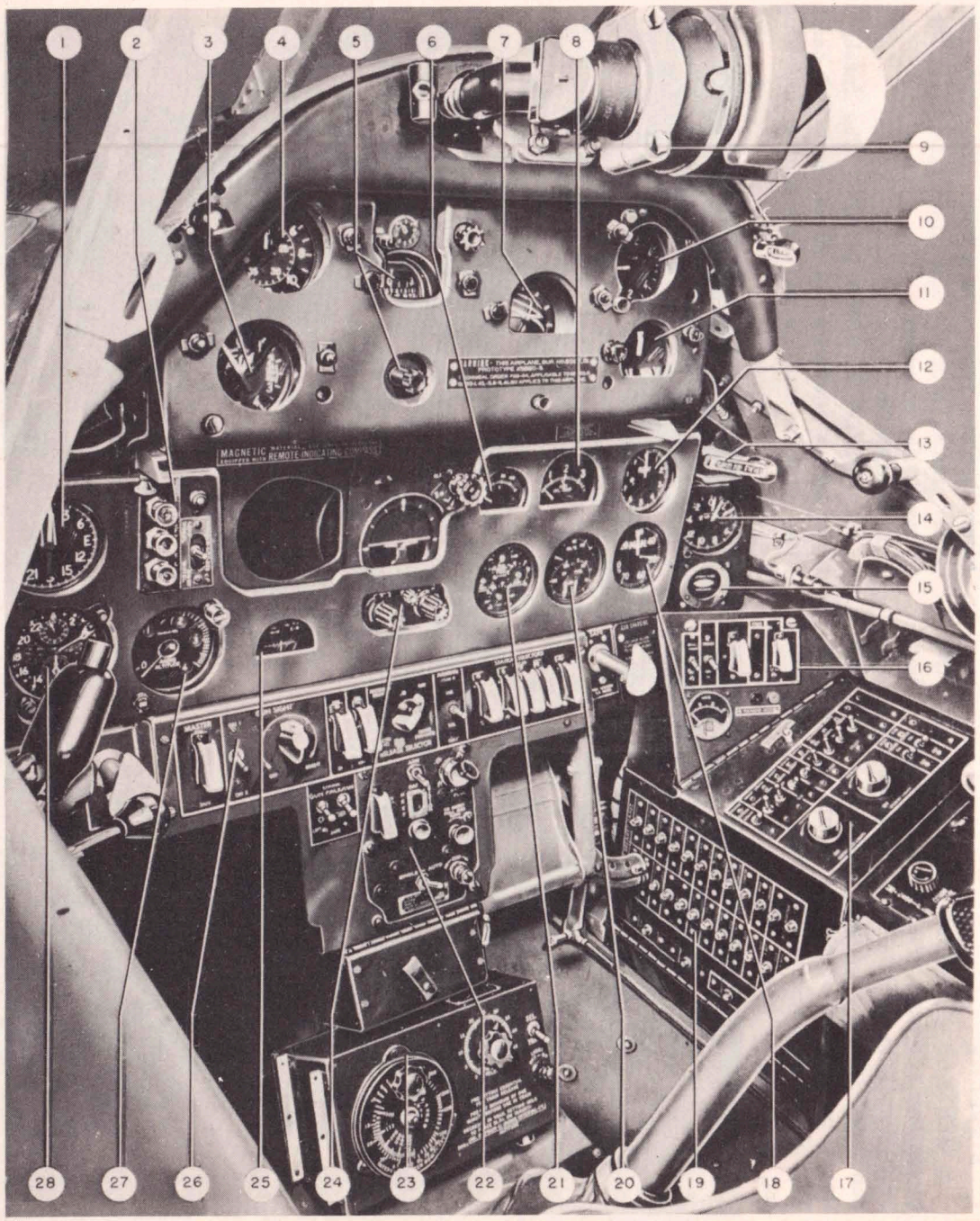


Figure 4—Instrument Panel

1. AIRPLANE.

a. GENERAL.—The SB2C-5 is a single engine, two place, low mid-wing dive bomber, weighing about 15500 pounds in the 1000 pound bomber full combat condition. It is a landplane and can be operated from a carrier with or without the aid of a catapult. The wing flaps, retractable landing gear, wing folding mechanism, bomb bay doors, gun chargers, bomb displacing gear, turtleback, cowl flaps, oil cooler flaps, brakes, and automatic pilot are hydraulically operated.

b. ARMAMENT.

(1) FUSELAGE BOMB LOADS.—The fuselage bomb bay is equipped with three Mark 51-7 bomb racks and is capable of carrying the following loads:

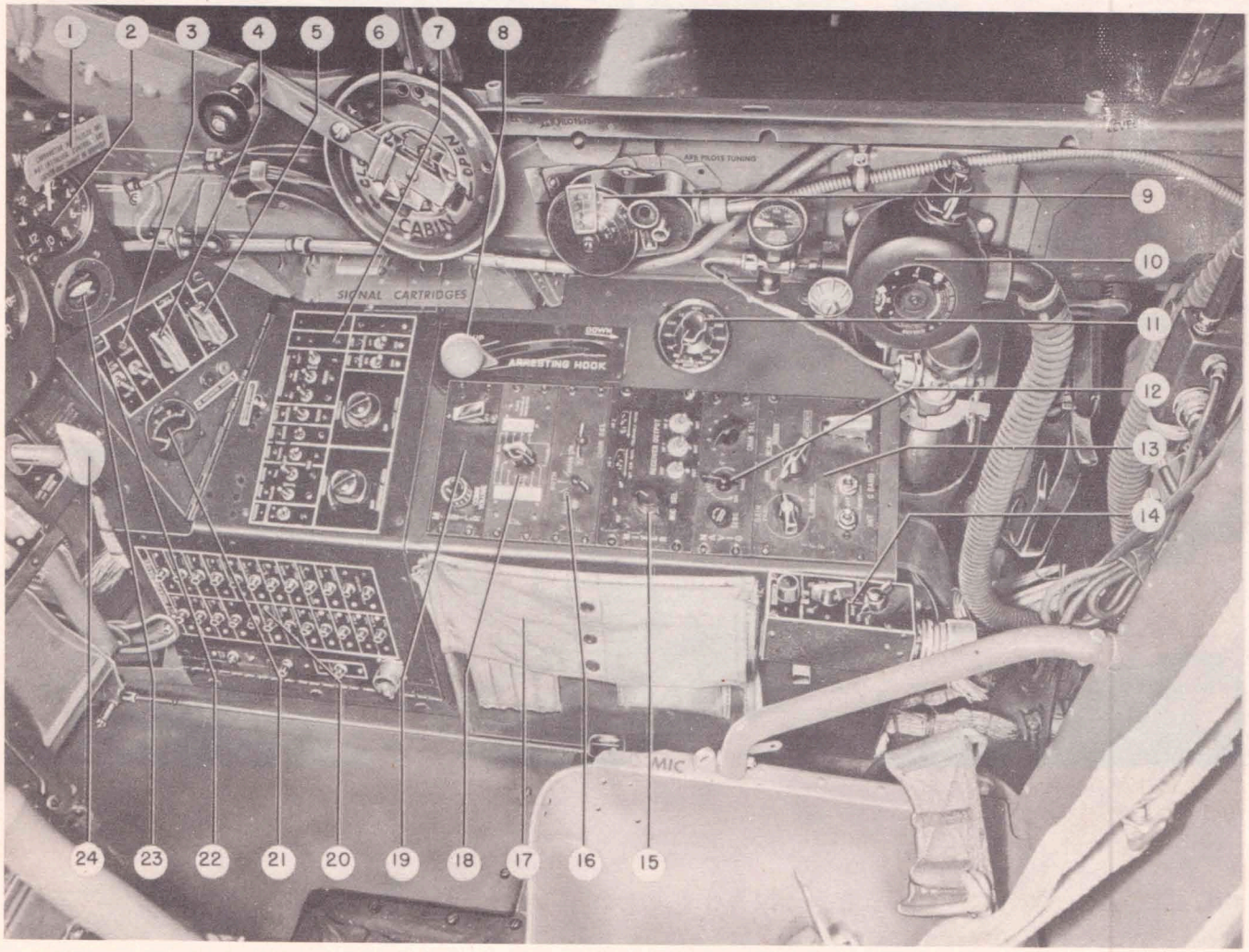


Figure 5—Right Side of Pilot's Cockpit

Parts list for figure 5.

1. Air filter control
2. Accelerometer
3. Primer switch
4. Starter switch
5. Generator field switch
6. Cabin crank
7. Light switch panel
8. Arresting gear control
9. ARB tuning control
10. Diluter demand regulator
11. Altitude limit switch
12. Navigation panel
13. IFF panel
14. ARB control box
15. Mixer panel
16. VHF panel
17. Map case
18. HF panel
19. Master panel
20. Circuit breaker panel
21. Voltmeter
22. Battery switch
23. Oxygen blinker indicator
24. Right gun charger

(a) Two 500-pound bombs.

(b) One smoke tank.

(c) One 1000-pound bomb.

(d) One 1600-pound armor piercing bomb.

(e) Two 1000-pound armor piercing bombs.

(f) One 2000-pound bomb.

(g) Three 120-pound cluster bombs (six 20-pound bombs per cluster).

(h) One 2200-pound torpedo and torpedo rack.

(2) WING BOMB RACK LOADS.—One Mark 51 Model 11 bomb rack is installed under each wing. Each rack is capable of carrying any one of the following loads:

(a) One 1000-pound bomb.

(b) One smoke tank.

(c) One 325-pound depth bomb.

(d) One 120-pound cluster bomb (six 20-pound bombs per cluster).

(e) One gun container equipped with two .50 caliber machine guns and 350 rounds of ammunition for each gun.

(3) ROCKETS.—Provisions are made for carrying eight rockets, four under each wing.

(4) FIXED GUNS.—Two 20 mm. cannons are mounted in the center panel, with 200 rounds of ammunition per cannon.

(5) AFT COCKPIT FLEXIBLE GUN INSTALLATION.—Twin .30 caliber machine gun installation with a total of 2000 rounds of ammunition.

c. OVERALL DIMENSIONS.

(1) SPAN (WINGS EXTENDED)—49 feet, 8 5/8 inches.

(2) SPAN (WINGS FOLDED)—22 feet, 6½ inches.

(3) LENGTH (PARALLEL TO GROUND, 3-POINT ATTITUDE)—36 feet, 8 inches.

(4) HEIGHT (3-POINT ATTITUDE, WINGS EXTENDED)—13 feet, 1½ inches.

(5) HEIGHT (3-POINT ATTITUDE, WINGS FOLDED)—16 feet, 10 inches.

(6) HEIGHT (3-POINT ATTITUDE, WINGS AT HIGH POINT OF TRAVEL)—20 feet, 6½ inches.

2. POWER PLANT.

a. GENERAL.—The airplane is powered by a radial air-cooled Wright Cyclone R2600-20 engine, having fourteen cylinders in two banks of seven cylinders each. This engine is equipped with a Stromberg model PR-48-A-3 injection carburetor and a two-speed single stage supercharger. The propeller is a four-bladed Curtiss Electric having a diameter of 12 feet 2 inches. A direct cranking electric starter is used.

b. POWER PLANT CONTROLS.

(1) THROTTLE.—This is the outboard lever on the engine controls quadrant. *(See figure 6.)* Its operation is conventional; to open the throttle push it forward. The quadrant is equipped with a notched spring type device so designed that a slight additional resistance to throttle movement is experienced when the throttle is opened past take-off manifold pressure (49 inches Hg. at sea level).

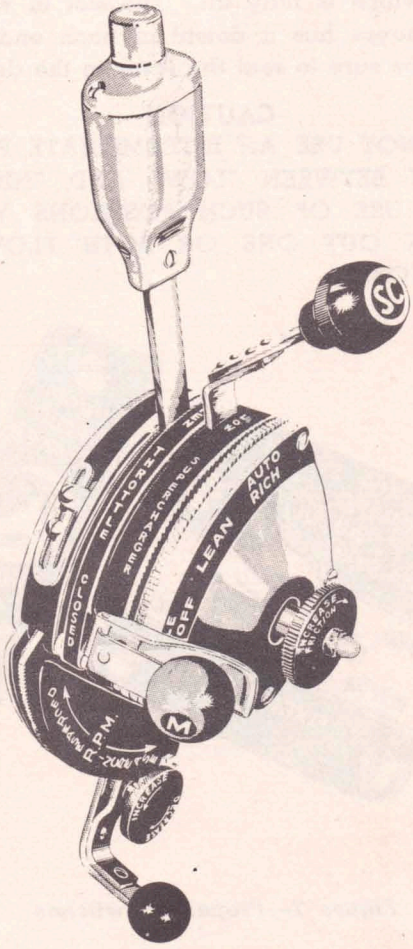


Figure 6—Engine Controls Quadrant

(2) FRICTION KNOB.—The engine controls quadrant is equipped with a friction knob for adjusting the amount of force required to operate the controls on the quadrant (throttle, mixture control, supercharger control, and propeller governor control). To increase friction, turn the knob clockwise; to decrease, turn counterclockwise. *(See figure 6.)*

(3) MIXTURE CONTROL.—The mixture control (marked "M") is the inboard lever on the engine controls quadrant, and has three positions: "IDLE CUT-OFF" auto lean (marked "LEAN"), and "AUTO RICH". An attached lock must be lifted in order to

move the control aft (toward "IDLE CUT-OFF"). Feel for the "notch", or seating of the control, when moving the lever to "LEAN" or AUTO RICH".

(4) SUPERCHARGER CONTROL.

(a) GENERAL. — The supercharger control (marked "SC") is the middle lever on the engine controls quadrant. It has two positions, the "LOW" blower position fully forward, and "HIGH" blower, which is fully aft. The slot in which the control moves has a detent at each end. When shifting, be sure to seat the lever in the detent.

CAUTION

DO NOT USE AN INTERMEDIATE POSITION BETWEEN "LOW" AND "HIGH". THE USE OF SUCH POSITIONS WILL BURN OUT ONE OR BOTH BLOWER CLUTCHES.

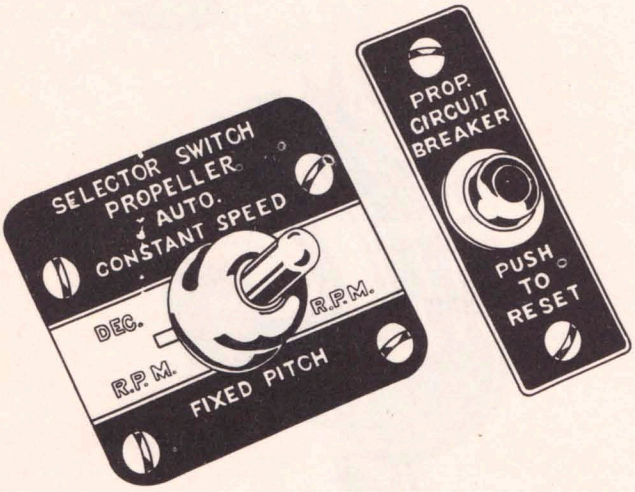


Figure 7—Propeller Switches

(b) SHIFT PROCEDURE DURING FLIGHT OPERATION.

1. To allow dissipation of heat from the clutches, do not shift the supercharger control at more than five minute intervals, except in an emergency. The control must be locked at the extremity of its travel in either ratio to prevent clutch slippage. If practicable, at the end of each five hour period of continuous operation in one ratio, shift into the other ratio for a period of five minutes.

2. TO SHIFT FROM "LOW" TO "HIGH" BLOWER.

a. Retard the throttle as necessary to prevent exceeding the desired manifold pressure in "HIGH" blower.

b. Shift mixture control to "AUTO-RICH".

c. Shift rapidly to "HIGH" blower at any speed from 1700 up to and including normal rated rpm. *(See Note 1.)*

d. Readjust rpm and throttle setting as necessary.

Note I

The minimum limit of 1700 rpm for shifting from "LOW" to "HIGH" blower is established for all R-2600 engines to insure proper engagement of the "HIGH" blower clutch. These engines are equipped with collapsible ring-type clutches, which depend on centrifugal forces derived from engine speeds of 1700 rpm and above to engage the "HIGH" blower. Once engaged, the "HIGH" blower will not disengage unless the engine speed falls below approximately 1000 rpm or the engine oil pressure is momentarily lost.

3. TO SHIFT FROM "HIGH" TO "LOW" BLOWER — "YELLOW NOSE" R-2600 ENGINES ONLY. *(See Note II.)*

a. Shift rapidly to "LOW" blower at any rpm up to and including normal rated rpm.

b. Readjust rpm and throttle setting as necessary.

Note II

"Yellow Nose" R-2600 engines are defined as those engines bearing a yellow stripe one inch wide painted around the crankcase front section, immediately behind the flange spacer. Such engines have a "LOW" blower clutch synchronizer valve which allows satisfactory shifting from "HIGH" to "LOW" blower at any rpm up to and including normal rated rpm. Production engines built after 2 April 1945 and service engines modified during overhaul to incorporate this improvement will be identified by the yellow stripe.

4. TO SHIFT FROM "HIGH" TO "LOW" BLOWER. — *ALL OTHER R-2600 ENGINES. (See Note III).*

Note III

R-2600 engines not incorporating the improvements outlined in Note II will not bear the yellow stripe on the crankcase front section. In such engines, when shifting from "HIGH" to "LOW" blower, both clutches are engaged for a period of one second, during which time great stresses are imposed on the drives. To reduce these stresses, shifts to "LOW" blower *must be carried out at 1500 rpm or less.*

(5) PROPELLER CONTROLS.

(a) **GENERAL.**—The propeller controls consist of a toggle switch and a circuit breaker button *(see figure 7)* located on the left console, and a propeller governor control on the engine controls quadrant. *(See figure 6.)*

(b) **TOGGLE SWITCH.**—This switch, marked "SELECTOR SWITCH PROPELLER", is mounted near the forward end of the left console. It has four positions: "AUTO CONSTANT SPEED", "INC. RPM", "DEC RPM", and "FIXED PITCH" (perpendicular to the face of the console). The last three positions are used for manual operation of the propeller; i.e., operation in which the pilot controls the blade angle. When operating the propeller manually, the pilot

changes the blade angle by moving the toggle switch to "INC RPM" or "DEC RPM" and holding it there until the tachometer and manifold pressure gage indicate that the desired blade angle has been obtained. He then releases the switch, and it snaps back to "FIXED PITCH". As long as the switch is at "FIXED PITCH", the blade angle remains fixed and the rpm varies with the throttle setting. However, the propeller is normally operated automatically; that is, the toggle switch is at "AUTO CONSTANT SPEED". With the switch in this position, the blade angle will vary so as to hold the rpm at a constant value determined by the position of the propeller governor control.

Note

For briefness, the term "AUTO" is used throughout this book in place of "AUTO CONSTANT SPEED".

(c) PROPELLER GOVERNOR CONTROL.—This control is located on the aft end of the engine controls quadrant. It is equipped with a ratchet type lock to hold it in position and a vernier dial for fine adjustment. The propeller governor control is used in conjunction with the toggle switch to maintain a constant rpm. With the toggle switch in "AUTO CONSTANT SPEED", adjust the governor control (up to decrease rpm and down to increase rpm) to the position giving the required rpm, and leave it there as long as this rpm is desired.

(d) PROPELLER CIRCUIT BREAKER BUTTON.—This button is located on the left console just forward of the propeller toggle switch. It must be pushed in before the toggle switch and governor control are operative.

(6) CARBURETOR ALTERNATE AIR CONTROL.—This control, marked "ALTERNATE CARB AIR", is an "L" shaped handle located to the left of the instrument panel *(see figure 3)*. The direct air position of the control is fully forward; the alternate position fully aft. No intermediate position should ever be used. Always lock the control by turning it one quarter turn clockwise, so that the handle points down. To unlock, turn the handle one-quarter turn counterclockwise so that the handle points inboard.

(7) CARBURETOR AIR FILTER CONTROL.—The "L" shaped handle on the right side of the instrument panel marked "CARB AIR FILTER *(see figure 9)*, controls four openings in the engine speed ring through which air is drawn when filtered air is necessary; that is, when operating under sandy or dusty conditions. For filtered air, pull the "CARB AIR FILTER" control handle fully aft and lock by rotating one-quarter turn clockwise. Filtered air cannot be obtained with the "ALTERNATE CARB AIR" control in the ALTERNATE (pulled aft) position.

(8) COWL FLAPS CONTROL.—The cowl flaps are hydraulically operated through a lever (indicated as "COWL FLAPS") mounted on the hydraulic controls quadrant. *(See figure 10)*. This control has three positions: "OPEN", "NEUTRAL", and "CLOSE".

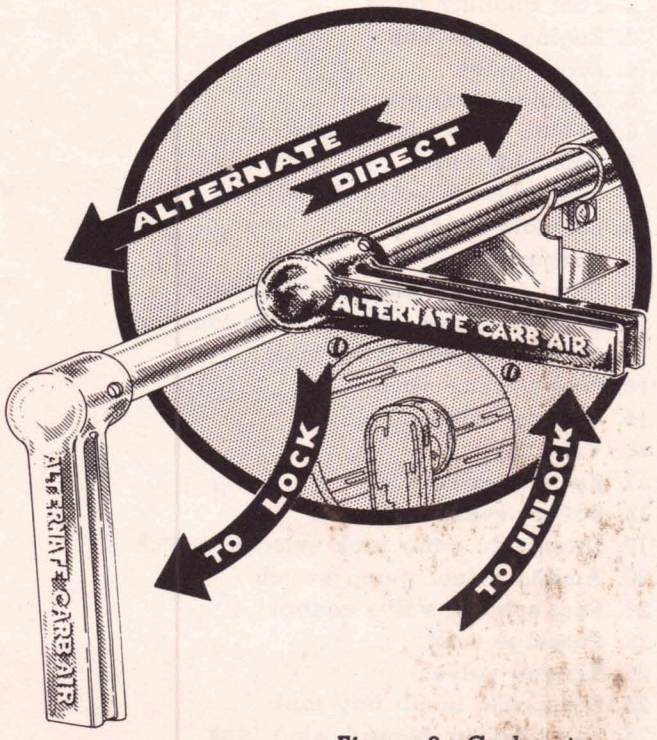


Figure 8—Carburetor Alternate Air Control

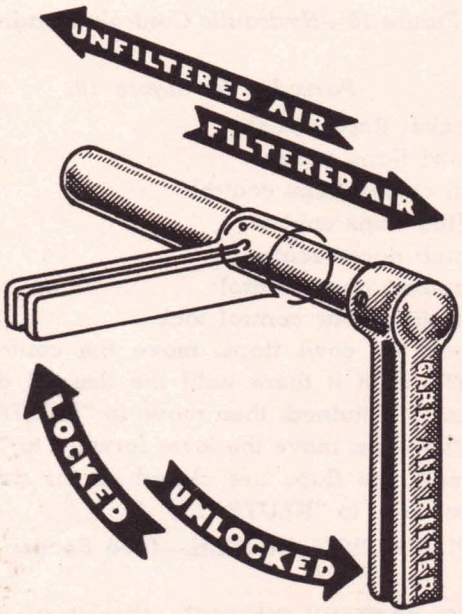


Figure 9—Air Filter Control

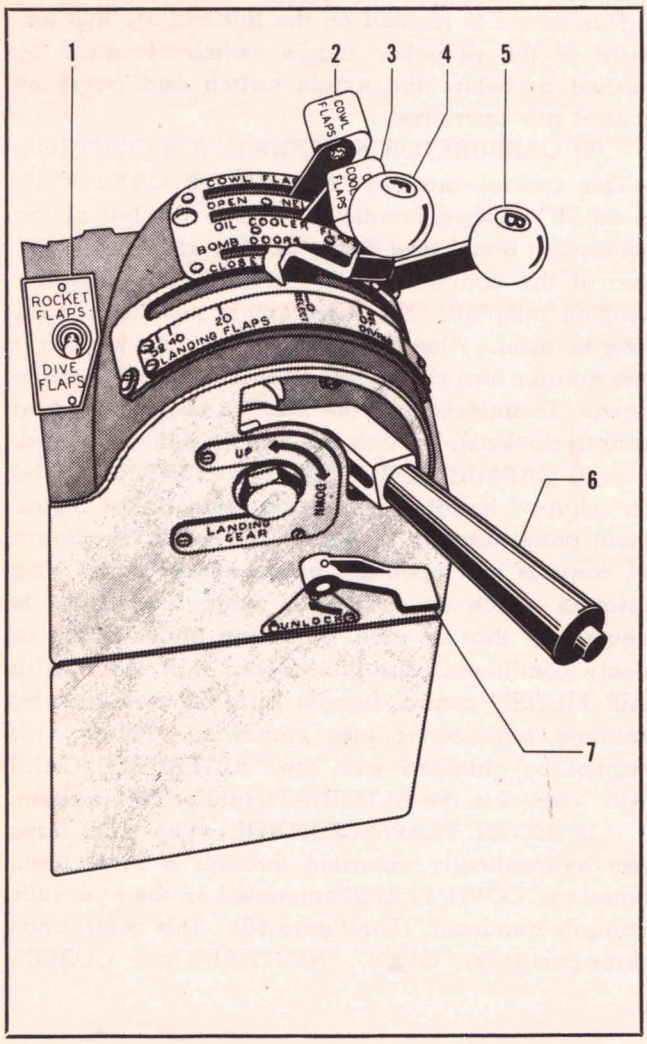


Figure 10—Hydraulic Controls Quadrant

Parts list for figure 10.

1. Rocket flaps switch
2. Cowl flaps control
3. Oil cooler flaps control
4. Wing flaps control
5. Bomb doors control
6. Landing gear control
7. Landing gear control lock

To open the cowl flaps, move the control aft to "OPEN", hold it there until the desired degree of opening is obtained, then move to "NEUTRAL". To close the flaps, move the lever forward to "CLOSE", hold until the flaps are closed as far as desired, then return it to "NEUTRAL".

(9) IGNITION SWITCH.—(See Section 1, paragraph 7-c (8)).

(10) BATTERY SWITCH.—(See Section I, paragraph 7-b. (1).

(11) PRIMER SWITCH.—(See Section I, paragraph 7-c. (7).

3. FLIGHT CONTROLS.

a. AILERON, ELEVATORS, AND RUDDER.—These controls are conventional, operated by the usual control stick and standard underhung rudder pedals. The pedals are adjustable by means of a spring loaded plunger located on the inboard side of each pedal. *(See figure 13.)*

b. TRIM TABS.

(1) GENERAL.—The trim tab controls, located in the aft section of the left console *(see figure 3)*, are rotated in the direction of the desired resultant motion of the airplane. Indicators adjacent to the controls show the degree of movement of the tabs.

(2) AILERON TRIM TABS.—The aileron trim tab control wheel is rotated counterclockwise to lower the left wing and clockwise to lower the right wing.

(3) ELEVATOR TRIM TABS.—The wheel controlling elevator trim tabs is rotated forward to lower the nose and aft to raise the nose of the airplane.

(4) RUDDER TRIM TAB.—Clockwise rotation of the rudder trim tab control turns the nose of the airplane to the right and counterclockwise turns it to the left.

c. FLAPS AND DIVE BRAKES.

(1) GENERAL.—Double split, hydraulically actuated, perforated flaps are attached to the trailing

Parts list for figure 11.

1. Left droppable wing tank
2. Fuel quantity gage
3. Engine gage unit
4. Drain valve
5. Auxiliary fuel pump
6. Engine driven fuel pump
7. Solenoid valve
8. Fuel selector valve control rod
9. Solenoid valve
10. Carburetor
11. Right inboard integral wing tank
12. Right outboard integral wing tank
13. Right droppable wing tank
14. Fuel selector valve
15. Kenyon valve
16. Vent line
17. Kenyon valve
18. Battery switch
19. Droppable wing tank selector switch
20. Auxiliary fuel pump switch
21. Fuel selector valve control
22. Fuselage tank
23. Kenyon valve
24. Droppable bomb bay tank
25. Left inboard integral wing tank
26. Left outboard integral wing tank.

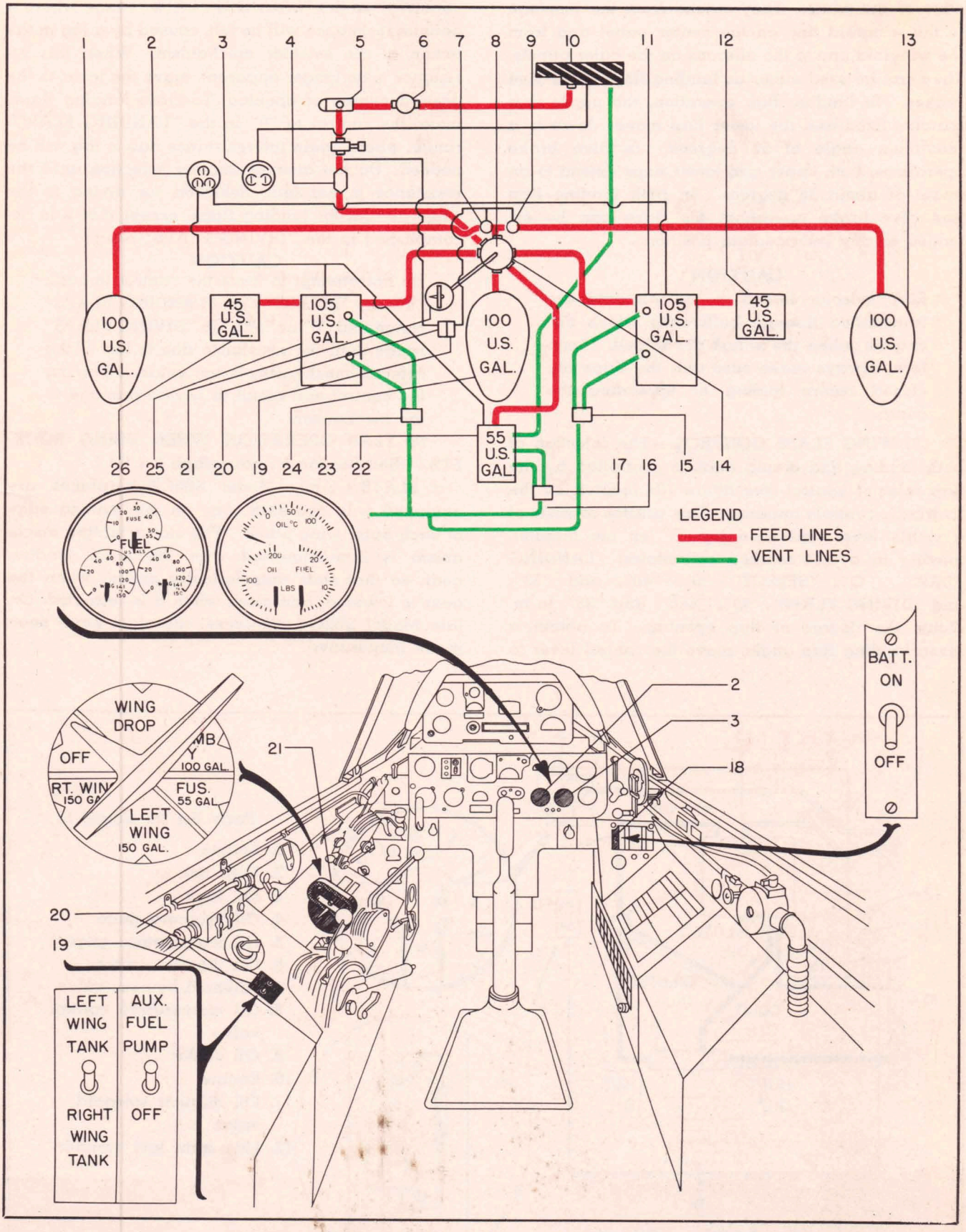


Figure 11—Fuel System Diagram

edge of the wings. They extend from the fuselage to the wingfold line on the center panel and from the wingfold line to the ailerons on the outer panels. They can be used either as landing flaps or as dive brakes. In landing flap operation, the upper flap remains fixed and the lower flap moves down to a maximum angle of 52 degrees. In dive brake operations, both upper and lower flaps extend to an angle of about 35 degrees. In both landing flap and dive brake operation, the flaps can be extended to any intermediate position.

CAUTION

Flap selector forces at the wingfold are transmitted through bellcranks which disengage when the wings are folded. Therefore, always make sure that the flaps are closed before folding or spreading the wings.

(2) WING FLAPS CONTROL.—The selection of both landing and diving flaps is controlled by the flap selector control *(see figure 10)*, located on the hydraulic controls quadrant. This control consists of a single lever (indicated by "F" on the handle), moving in a slot marked as follows: "LANDING FLAPS", "O", "SELECT", "0", "40", and "52"; and "DIVING FLAPS", "O", "SEL", and "35", to indicate the degree of flap opening. To obtain a given landing flap angle, move the control lever to "SELECT" in the "LANDING FLAPS" range where a definite resistance will be felt, caused by a lag in the action of the selector mechanism. When this resistance is no longer apparent, move the lever to the desired degree of opening. To close landing flaps, move the control to "0" in the "LANDING FLAPS" range, where again the resistance due to lag will be noticed. Do not attempt another selection until the resistance is not felt. Selection for diving is the same as that for landing flaps, except that it is accomplished in the "DIVING FLAPS" range.

CAUTION

Do not attempt to force the control through "0" or "SELECT" in "LANDING FLAPS" range and "0" or "SEL" in "DIVING FLAPS" range until the resistance due to lag in the selector mechanism is not evident. Forcing the control will result in severe damage to the mechanism.

(3) FLAP OPERATION WHEN USING ROCKETS.—(See Section V, paragraph 2 i (2)).

d. SLATS.—Early Model SB2C-5 airplanes are equipped with two slats, one on the leading edge of each outer wing panel. The slat actuating mechanism is interconnected with the main landing gear, so that slats automatically extend when the gear is lowered, and close when it is retracted. On late Model SB2C-5 airplanes, the slats have been made inoperative.

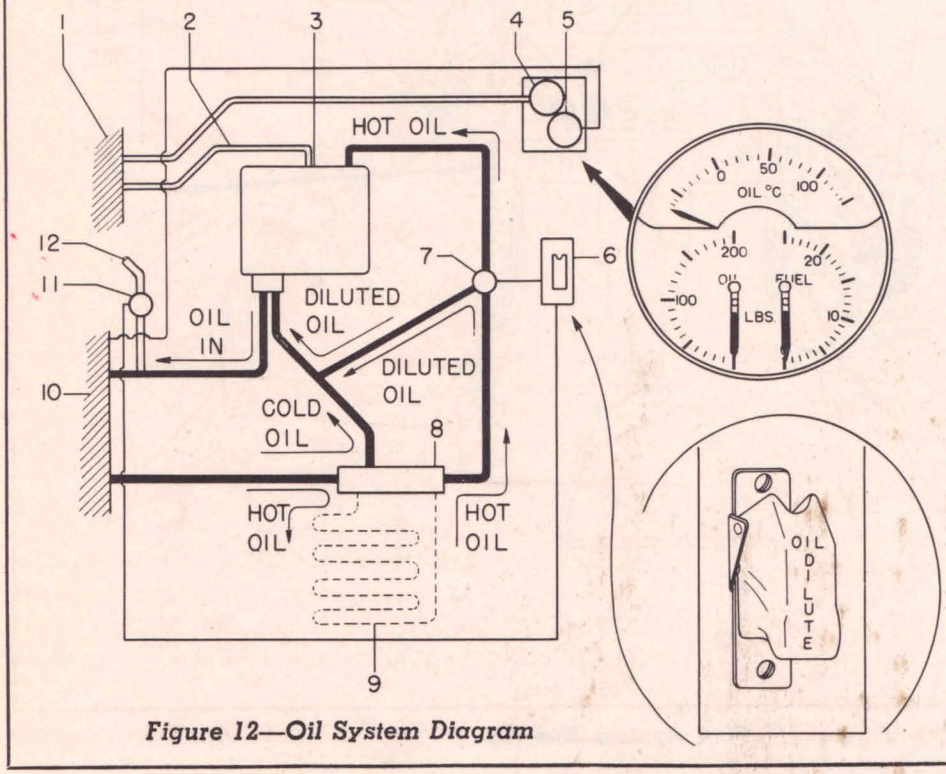


Figure 12—Oil System Diagram

Parts list for figure 12

1. Engine
2. Vent line
3. Oil tank
4. Oil pressure gage
5. Oil temperature gage
6. Oil dilution switch
7. Solenoid by-pass valve
8. Oil temperature control valve
9. Oil cooler
10. Engine
11. Oil dilution solenoid valve
12. Line from fuel strainer

4. FUEL SYSTEM.

(See figure 11.)

a. DESCRIPTION.—The fuel system is basically a forced feed type, making use of an engine driven pump and an electric auxiliary pump, and having provisions for five internal self-sealing tanks and three droppable tanks.

b. FUEL SPECIFICATION. — AN-F-28, grade 100/130.

c. FUEL PRESSURE.—16 to 18 psi desired.

d. PUMPS.—The main fuel pump is engine driven, mounted on the right hand side of the engine. An electric auxiliary fuel pump is installed in the fuel system between the fuel tank selector valve and the engine driven pump, and is located aft of the firewall on the lower left longeron.

e. FUEL TANKS.

(1) GENERAL.—The tank consists of four self-sealing internal wing tanks and one self-sealing internal fuselage tank. Two droppable wing tanks and a droppable bomb bay tank may also be carried. The internal wing tanks are interconnected, with the feed lines to the selector valve leading out of the larger (105 gallons) tanks, which are located in the inboard position in the wings.

(2) TANK CAPACITIES.

FUSELAGE TANK—55 U. S. (46 Imp.) gallons.
WING TANK, INTERNAL, LEFT.—105 U. S. (87 Imp.) gallons.
WING TANK, INTERNAL, LEFT.—45 U. S. (37 Imp.) gallons.
WING TANK, INTERNAL, RIGHT.—105 U. S. (87 Imp.) gallons.
WING TANK, INTERNAL, RIGHT.—45 U. S. (37 Imp.) gallons.
DROPPABLE, LEFT.—(Mk. 4) 100 U. S. (83 Imp.) gallons.
DROPPABLE, RIGHT.—(Mk. 4) 100 U. S. (83 Imp.) gallons.
DROPPABLE, BOMB BAY.—100 U. S. (83 Imp.) gallons.

f. VAPOR RETURN.—The vapor return lines to the fuselage tank will normally return 3 to 5 gallons per hour. Therefore when operating with all tanks full, use about 10 gallons of fuel from the fuselage tank before selecting one of the other tanks. This is necessary to make room for the returned fuel which otherwise would overflow into the vent line.

g. FUEL SYSTEM CONTROLS.

(1) FUEL SELECTOR VALVE.—The control for the selector valve is mounted on the left console *(see figure 11)*. Six positions are indicated on the control dial: "LEFT WING", "FUSE", "BOMB BAY", "RIGHT WING", "WING DROP", and "OFF". Be sure to feel for the "notch" in the selector valve when moving the control to a given segment.

(2) SELECTION OF DROPPABLE TANKS.—An electric toggle on the left console operates two solenoid valves in the lines from the droppable wing tanks. This switch has two positions marked "LEFT WING TANK" and "RIGHT WING TANK". *(See figure 11).* For tank shifting procedure see Section II, paragraph 3, a. (2)

(3) JETTISONING CONTROLS. — The controls used for jettisoning the droppable tanks are the same as those used for dropping the bombs, namely, the armament master switch, station selector switches, release selector switch, and the bomb release button located on the control stick. The tanks may be jettisoned manually in salvo by pulling up on the "EMERGENCY SALVO RELEASE" tee handle. *(See figure 3.)* (See Section V, paragraph 2d, for bomb release procedure.)

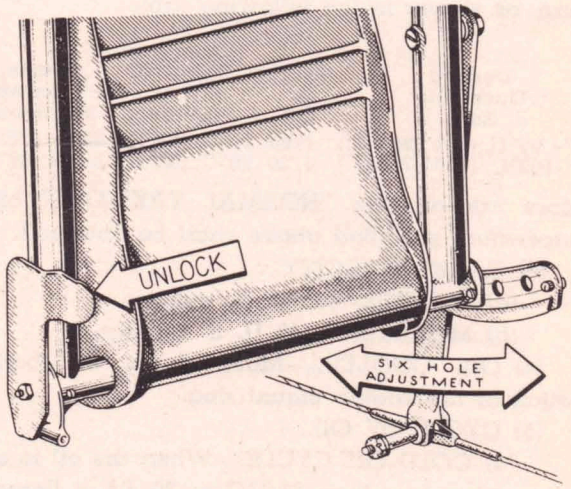


Figure 13—Rudder Pedal Adjustment

(4) AUXILIARY FUEL PUMP CONTROL.—The auxiliary fuel pump is controlled by a switch set in the left console, next to and immediately forward of the droppable wing tanks switch. *(See figure 11.)* This switch has two positions "AUX FUEL PUMP" and "OFF"; flip the switch to "AUX FUEL PUMP" to turn on the pump.

(5) PRIMER.—The priming unit is operated through a switch located on the right hand console. *(See figure 15.)* The switch has two positions "PRIMER" and "OFF". To operate, flip the switch to "PRIMER" and hold it there. When released, the switch will snap back to "OFF".

(6) FUEL QUANTITY GAUGE.—An electrically operated fuel quantity gauge with three indicators,

marked "WING", "FUSE", and "WING", mounted on the lower left instrument panel on airplanes through Bureau Number 83352 *(see figure 11)*, and on the lower right instrument panel on airplanes Bureau Number 83353 and subsequent, shows the fuel contained in the internal fuselage and wing tanks. The gauge operates automatically when the battery switch is turned "ON". Since no provision is made for indicating the amount of fuel contained in the droppable tanks, consumption from these tanks must be determined from the elapsed time during which fuel is withdrawn.

(7) FUEL PRESSURE GAUGE.—The fuel pressure gauge is contained in the engine gauge unit, mounted on the lower instrument panel. *(See figure 11.)*

5. OIL SYSTEM.

a. GENERAL.

(1) OIL SPECIFICATION.—AN-VV-O-446.

(2) GRADE OF OIL.—This varies with temperature, as shown in the following table:

Desired Operating Zone	Grade of Oil	Emergency Take-off Only Minimum	Normal Take-off Minimum
54°- 95°C. (129°-203°F.)	1100	15°C. (59°F.)	25°C. (77°F.)
60°-102°C. (140°-216°F.)	1120	20°C. (68°F.)	30°C. (88°F.)

Before take-off, the "NORMAL TAKE-OFF" oil-in temperature specified above shall be obtained.

(3) TANK CAPACITY.

(a) SERVICE.—37 U. S. gallons.

(b) MAXIMUM.—45 U. S. gallons.

(4) OIL COOLER..—Mounted on the bottom portion of the engine mount ring.

(5) CYCLE OF OIL.

(a) COLD OIL CYCLE.—When the oil is cold (temperature less than 21.1°C or 70°F.), it flows as follows: from the tank into the engine, through an engine-driven pump and two scavenger pumps, then into the oil temperature control valve, which passes it back to the bottom of the tank.

(b) WARM OIL CYCLE.—Warm oil (temperature greater than 21.1°C or 70°F) flows from the tank through the engine and pumps into the oil temperature control valve, which passes it through the oil cooler into the top of the tank.

(6) OIL DILUTION SYSTEM. This system consists of a line leading from the top of the fuel strainer to the oil-in line leading to the engine. A manually operated shut-off valve in the gas line between the strainer and the oil-in line must be opened before the system can be operative. If, just before the engine is stopped, a solenoid operated valve in the line from the carburetor is opened, it allows gasoline to flow into the oil going to the engine, thereby thinning the oil and facilitating cold weather starting. At the time this solenoid opens, another solenoid valve in the warm oil return line opens, causing any warm oil to be by-passed to the cold oil return line. The cycle of diluted oil is as follows: through the engine into the oil temperature control valve, through the oil cooler and into the bottom of the oil tank. (For dilution procedure, see Section II, paragraph 17. c.)

(7) OIL SYSTEM OPERATING PRESSURES.

(a) MINIMUM. —80 psi.

(b) DESIRED. —85-90 psi.

(c) MAXIMUM.—90 psi.

(d) IDLING. —15 psi.

b. OIL SYSTEM CONTROLS.

(1) OIL COOLER FLAPS CONTROL.—The oil cooler flaps are hydraulically operated through a lever located on the hydraulic controls quadrant, having three positions: "OPEN", "CLOSE", and "NEUTRAL". To obtain a given oil cooler flap adjustment, move the control to "OPEN" and hold it there until the desired flap opening is obtained, then move the lever to "NEUTRAL". (A gauge marked "OIL COOLER FLAPS" *(see figure 4)* at the left of the

Parts list for figure 14.

1. Engine driven pump
2. Reservoir
3. Check valve
4. By-pass valve
5. Check valve
6. Hand pump
7. Right gun charger
8. System accumulator air gage
9. Brake accumulator air gage
10. Hydraulic controls quadrant
11. Shut-off valve
12. Auto pilot oil pressure gage
13. Wing fold valve
14. Wing fold lock
15. Left gun charger
16. Hydraulic system pressure gage
17. To gun chargers
18. To wing fold
19. To displacing gear
20. To bomb doors
21. To Cowl flaps
22. To oil cooler flaps
23. To auto pilot
24. To flaps
25. To landing gear
26. To brake drums
27. Check valve
28. Brake accumulator
29. System accumulator
30. Unloading valve

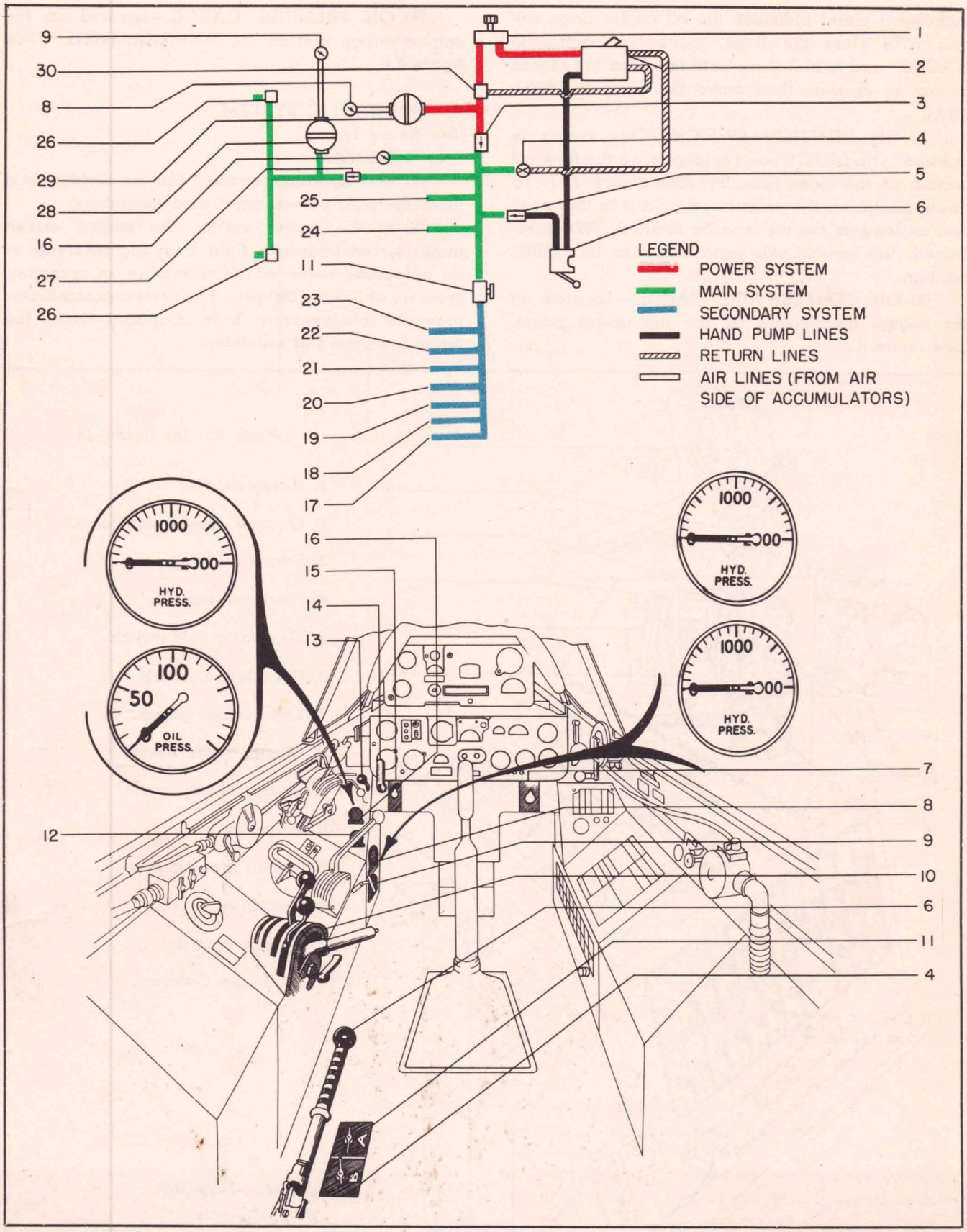


Figure 14—Hydraulic System Diagram

instrument panel indicates the oil cooler flaps setting.) To close the flaps, move the control to "CLOSE" and hold it there until the flaps are closed as far as desired, then move the lever to "NEUTRAL".

(2) OIL DILUTION SWITCH.—This switch is marked "OIL DILUTE" and is located on the forward section of the right console. *(See figure 15.)* To dilute oil, lift up the switch and hold it in that position as long as the oil is to be thinned. When released, the switch will snap down to its "OFF" position.

(3) OIL TEMPERATURE GAUGE.—Located on the engine gauge unit on the instrument panel. *(See figure 4.)*

(4) OIL PRESSURE GAUGE.—Located on the engine gauge unit on the instrument panel. *(See figure 4.)*

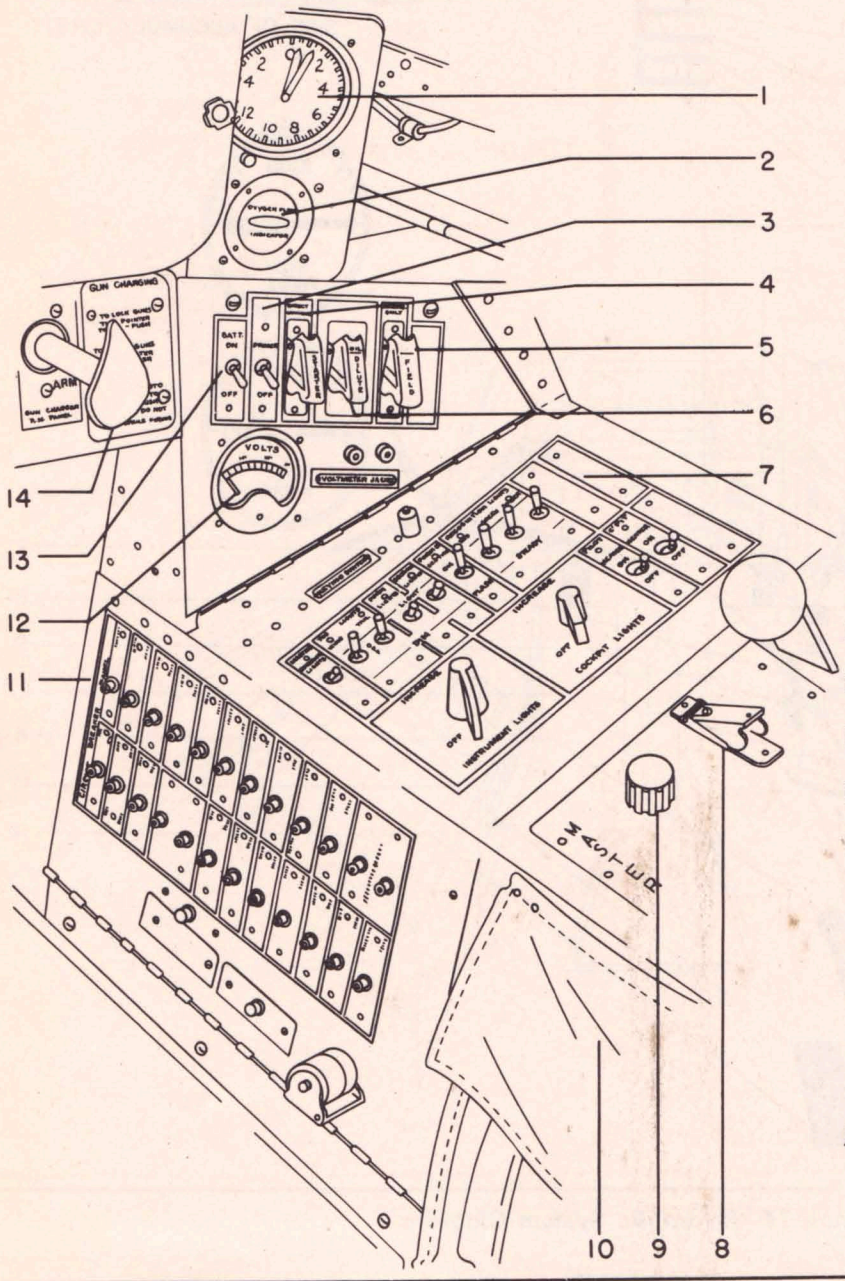
6. HYDRAULIC SYSTEM.

(See figure 14.)

a. GENERAL.

(1) The hydraulic system can be divided into three systems: power, main, and secondary.

(2) In the power system the engine driven pump forces hydraulic fluid from the reservoir to an unloading valve which maintains an operating pressure of 850 to 1050 psi. The system accumulator prevents this pressure from dropping when the pump is stopped or unloaded.



Parts list for figure 15

1. Accelerometer
2. Oxygen blinker indicator
3. Primer switch
4. Starter switch
5. Generator field switch
6. Oil dilution switch
7. Light switch panel
8. Master radio switch
9. Radio volume control
10. Map case
11. Circuit breaker panel
12. Voltmeter
13. Battery switch
14. Right gun charger

Figure 15—Forward Right Console

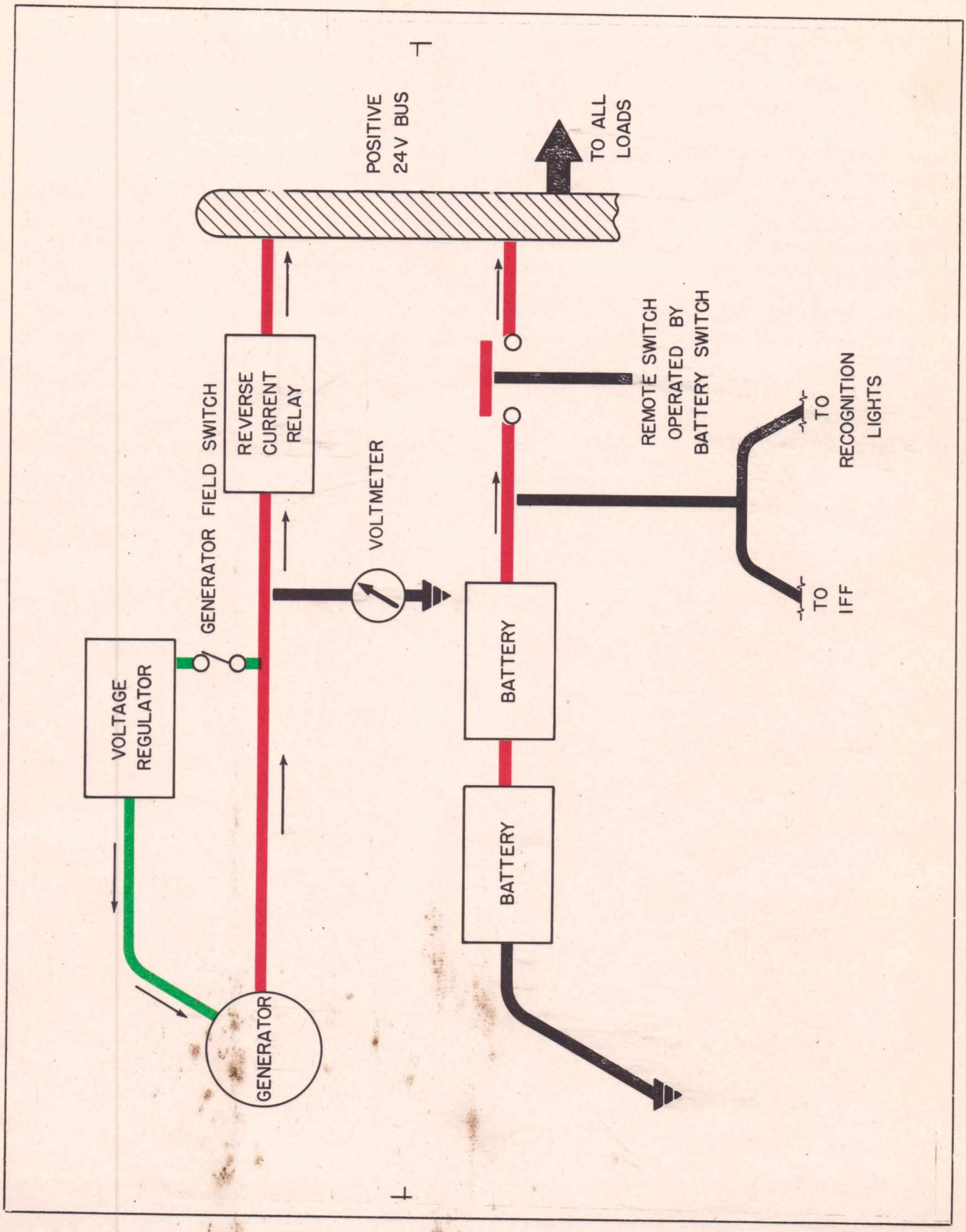


Figure 15A—Generator and Battery Diagram

(3) The main system includes brakes, wing flaps, and landing gear. A second accumulator is used to maintain brake hydraulic pressure.

(4) The secondary system includes the automatic pilot, displacing gear, gun chargers, cowl flaps, oil cooler flaps, bomb doors, and wingfold, of which all except the automatic pilot operate on the 850 to 1050 psi pressure. The auto pilot operates on a pressure of 155 plus or minus 20 psi. Hydraulic fluid before entering the auto pilot is lowered to this pressure by a reducer.

b. CONTROLS.

(1) SHUT-OFF VALVE.—The valve on the pilot's floor left of the seat, marked "A", is the shut-off valve *(see figure 14)*, used to isolate the secondary system from the main and power systems. This valve is in open position during normal operation.

(2) BY-PASS VALVE. — This valve, designated "B" (figure 14.) is immediately aft of the "A" valve. The pressure in the system can be dumped by opening this valve; therefore, it is closed during normal operation.

(3) HYDRAULIC HAND PUMP—PILOT'S COCKPIT.—The hand pump is on the left side of the pilot's seat. *(See figure 14.)* It is used to create pressure in the hydro system for tests of landing gear, flaps, gun chargers, bomb doors, windfold, etc., operation when the engine is not running. It is also used for emergency operation during flight (see Section IV, paragraph 6).

(4) HYDRAULIC HAND PUMP — GUNNER'S COCKPIT.—This pump is located on the left hand side of the gunner's cockpit *(see figure 44)*, and is employed to raise and lower the turtleback. It is used in conjunction with a control valve *(see figure 44)* positions of which are "UP", "NEUTRAL", and "DOWN". To raise the turtleback, turn the valve control handle to "UP", operate the hand pump until the turtleback is in its fully raised position, then move the control handle to "NEUTRAL". To lower, turn the handle to "DOWN", operate the pump until the turtleback is collapsed, and move the control handle to "NEUTRAL".

(5) GAUGES.—On the forward inboard face of the left console are two gauges, the system accumulator air gauge *(see figure 14)*, and the brake accumulator air gauge *(see figure 14)*, which are connected to the air sides of the accumulators. A third gauge indicating system pressure *(see figure 14)*, is mounted to the left of the instrument panel and should normally read from 850 to 1050 psi. The pressure gauge for the automatic pilot is located below and to the right of the system pressure indicator. *(See figure 14.)*

(6) EMERGENCY HYDRAULIC OPERATION.—(Refer to Section IV, paragraph 6. *a.*)

7. ELECTRICAL SYSTEM.

a. GENERAL.

(1) The electrical system is, with few exceptions, the open wire type. Aside from some of the radio circuits, the system employs single conductor circuits which use the frame of the airplane as the ground return. Current is supplied by two 12-volt batteries connected in series, and a 27.7 volt generator. Power for radio circuits is provided by a dynamotor and a motor alternator. The following are operated by the electrical system: radio, lights, starter, propeller, auxiliary fuel pump, pitot heater, armament equipment, rocket flaps, drop wing tanks control, indicating and warning lights.

b. ESSENTIAL CONTROLS.

(1) BATTERY SWITCH.—The battery switch is located on the forward inboard section of the right console. *(See figure 15.)* Two positions are indicated, "ON" and "OFF".

(2) EMERGENCY GENERATOR FIELD SWITCH.—Located on the outboard side of the forward right console, marked "EMERG ONLY". Flip up to turn "OFF". This switch must be "ON" at all times except in an emergency.

(3) VOLTMETER.—The voltmeter is below the battery switch, on the forward right console. *(See figure 15.)* Turning the battery switch to "ON" will not give a reading on the voltmeter, as it is connected to read generator voltage. The normal reading should be between 27 and 28.5 volts when the engine is turning approximately 1400 rpm.

(4) EXTERNAL POWER RECEPTACLE.—This receptacle is located in the right wing wheel pocket. It is used as a contact for auxiliary power when starting the engine. The battery switch must be "ON" when using external power.

c. MISCELLANEOUS CONTROLS.

(1) EXTERIOR LIGHTS.

(a) MASTER EXTERIOR LIGHT SWITCH.—This switch, on the right console *(see figure 15)*, must be "ON" before any exterior lights can be used.

(b) APPROACH LIGHT.—The approach light is in the leading edge of the left wing. It is operated by a switch on the right console *(see figure 15)*, for practice night carrier landings executed ashore, when the arresting hook is not to be unlatched or operated automatically by extending the hook prior to actual carrier night landings. In either case, the "MASTER EXTERIOR LIGHT" switch must be "ON".

(c) FORMATION LIGHTS.—There is a formation light on each wing, operated by the "ON-OFF-FLASH" and "DIM-BRIGHT" switches *(see figure 15)* on the right console.

(d) RECOGNITION LIGHTS.—The recognition lights consist of three colored lights on the under side of the right wing. Their controls are located on the right console switch panel. *(See figure 15.)* To flick the lights on and off intermittently, move the control switches to "KEY" and operate the keying switch. *(See figure 15.)*

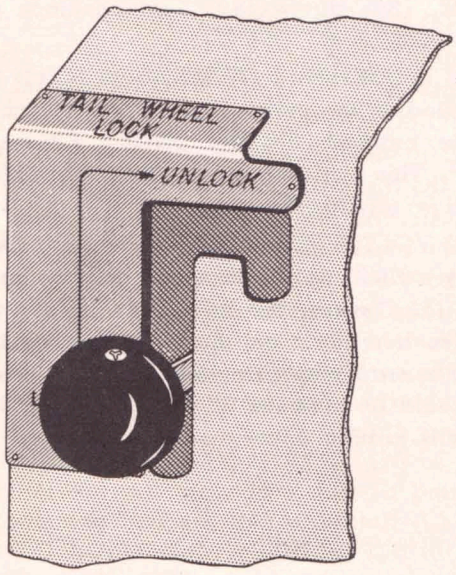


Figure 16—Tail Wheel Lock Control

(e) RUNNING LIGHTS.—There is a running light on each wing tip and one on the tail of the airplane. Control is by two "BRIGHT-DIM-OFF" switches *(see figure 15)* on the right hand consol.

(f) SECTION LIGHT.—The section light is located on top of the fuselage, aft of the gunner's enclosure. This light is controlled by two switches *(see figure 15)*, one the "BRIGHT-DIM" type and the other, which also controls the formation lights, the "ON-FLASH" type. To flash the lights, turn the switch to "FLASH" position and release it.

(2) INTERIOR LIGHTS.

(a) COCKPIT and CHARTBOARD LIGHTS.—Six indirect red lamps, three on each side of the cockpit, are controlled by a rheostat in the electrical panel. *(See figure 15.)* Two lights for illuminating the chartboard are located at the top of the instrument panel and are controlled by the same rheostat.

(b) INSTRUMENT LIGHTS.—The instrument panels are lighted by means of indirect red lamps, controlled by a rheostat *(see figure 15)* in the electrical panel. Fifteen spare lamps are carried in three holders located in the lower edge of the bottom instrument panel, below and right of the engine gauge unit.

Figure 17—Arresting Hook Control

(3) CIRCUIT BREAKERS.—The circuit breaker panel *(see figure 15)* is conventional, all breakers are of the "push to reset" type and show a luminous ring when not in the normal "in" condition. Before take-off, all breakers should be visually inspected to assure they are properly set.

(4) RECEPTACLE.—A receptacle *(see figure 15)* for portable equipment is located on the circuit breaker panel. No "on-off' switch is provided, it being intended that the plug be disconnected when it is desired to turn off the equipment.

(5) ARMAMENT SWITCHES.—The armament electrical controls are all contained in the armament panel *(see figure 15)* just below the main instrument panel. (For operation or armament controls, refer to Section V, paragraph 2.)

(6) RADIO.—Switches and control boxes for the pilot's radio equipment are located on the aft section of the right console. *(See figure 42.)* (For operation of radio gear, see Section V, paragraph 3.).

(7) PRIMER SWITCH.—Located on the forward inboard section of the right console, has two positions "PRIMER" and "OFF". *(See figure 15.)* To energize the priming system, hold the toggle at "PRIMER"; when released it will return to "OFF."

(8) IGNITION SWITCH.—This switch is on the left console *(see figure 3)*, and has four positions: "BOTH," "L," "R," and OFF."

(9) OIL DILUTION SWITCH.—See Section I, paragraph *b.* (2).

(10) PROPELLER BREAKER SWITCH.—See Section I, paragraph (5) (*a*).

(11) PROPELLER SELECTOR SWITCH. — See Section I, paragraph (5) (*b*).

(12) AUXILIARY FUEL PUMP SWITCH.—See Section I, paragraph *b.* (4).

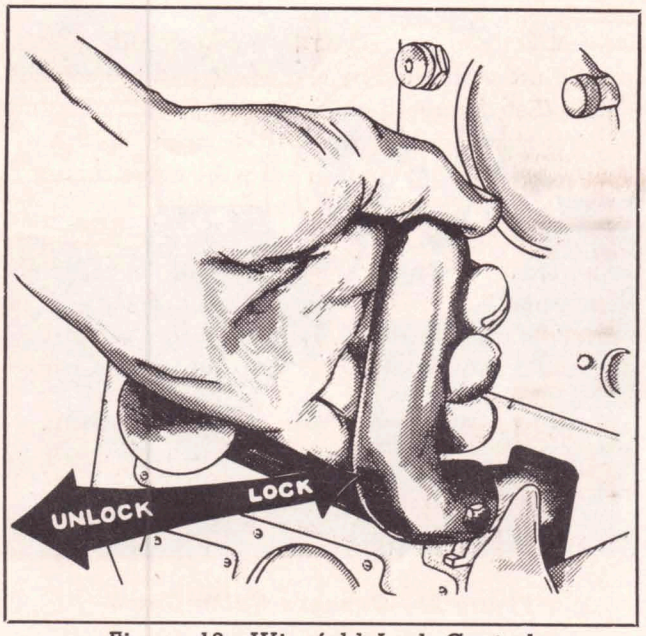


Figure 18—Wingfold Lock Control

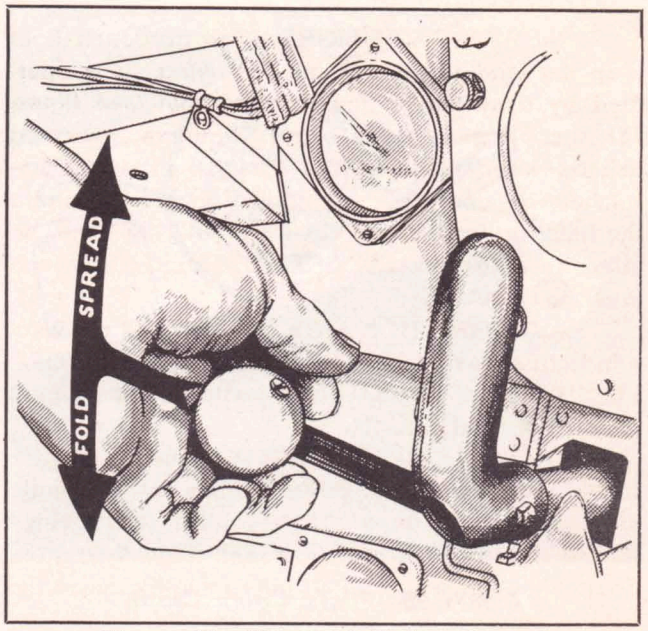


Figure 19—Wingfold Valve Control

(13) DROPPABLE WING TANK SWITCH.—See Section I, paragraph b. (2).

8. AUXILIARY CONTROLS.

a. AUTOMATIC PILOT.

(1) GENERAL.—The automatic pilot is hydraulically operated. The controls for it consist of a directional gyro and a bank and climb gyro mounted on the upper instrument panel, and a control valve *(see figure 3)* on the left console.

(2) CONTROL VALVE.—This valve has three positions: "OFF," "BLEED," and "ON." When "ON", it allows hydraulic oil to flow through the auto pilot system and actuate struts which operate the air controls. Turning the valve to "BLEED" causes the flow of hydro oil to bypass the servo units, thereby bleeding out any air that may be in the system. Moving the valve to "OFF" shuts off the flow of oil, rendering the system inoperative.

(3) BANK AND CLIMB GYRO.—This instrument is located on the instrument panel on the centerline of the airplane. *(See figure 4.)* It contains an artificial horizon and a miniature airplane, and is equipped with the following dials:

(a) AILERON AND ELEVATOR SIGNAL ADJUSTING DIALS.—Located at the top of the instrument. *(See figure 4.)* Rotate clockwise to increase "signal strength" or sensitiveness of the instrument.

(b) AILERON AND ELEVATOR TRIM ADJUSTING KNOBS.—At bottom of instrument. *(See figure 4.)* Rotate aileron knob in direction of desired wing heaviness. Rotate elevator knob clockwise for dive; counterclockwise for climb.

(c) ADJUSTING KNOB FOR MINIATURE AIRPLANE.—At bottom of instrument. *(See figure 4.)* Turn clockwise to move airplane up.

(d) CAGING KNOB.—Upper right corner of instrument. *(See figure 4.)* Pull aft and turn fully clockwise to "cage" or lock the instrument.

(4) DIRECTIONAL GYRO.—This instrument is located at the top of the panel, left of the center line of the airplane. *(See figure 4.)* It contains two compass cards, one of which remains fixed in space while the other turns with the airplane. The former is called the "directional card" and is the bottom card on the instrument. The latter is the top card and is called the "reference card." (To the pilot, this is the card which remains fixed, while the other seems to turn). The instrument is equipped with the following dials:

(a) DIRECTIONAL CARD ADJUSTING DIAL.—Located at the bottom of the instrument. *(See figure 4.)* Rotate to turn the direction card.

(b) REFERENCE CARD ADJUSTING DIAL.—In the upper right corner of the instrument. *(See figure 4.)* Rotate to turn the reference card.

(c) SIGNAL ADJUSTING KNOB.—Located in the upper left corner of the directional gyro. *(See figure 4.)* Turn clockwise to increase "signal strength" or sensitiveness of the instrument.

(d) CAGING KNOB.—At bottom of instrument (this is the same dial that adjusts the directional card). Push forward to "cage" or lock the gyro.

(e) AUTO PILOT OIL PRESSURE GAUGE.—Refer to Section I, paragraph 6. *b.* (5).

b. ATTITUDE GYRO INDICATOR.

(1) This instrument *(see figure 4)* provides an indication of any attitude of the aircraft in roll or pitch. With the airplane on the ground and the battery switch "OFF," the indicator will give a false reading. In approximately five minutes after the

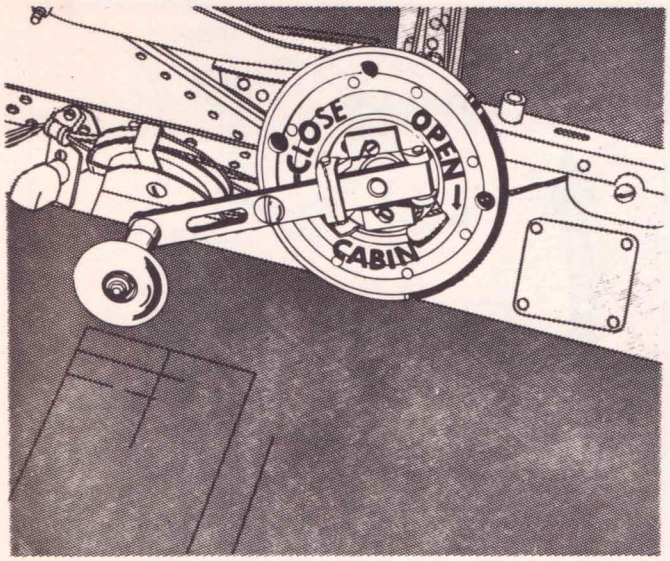


Figure 20—Pilot's Cabin Crank

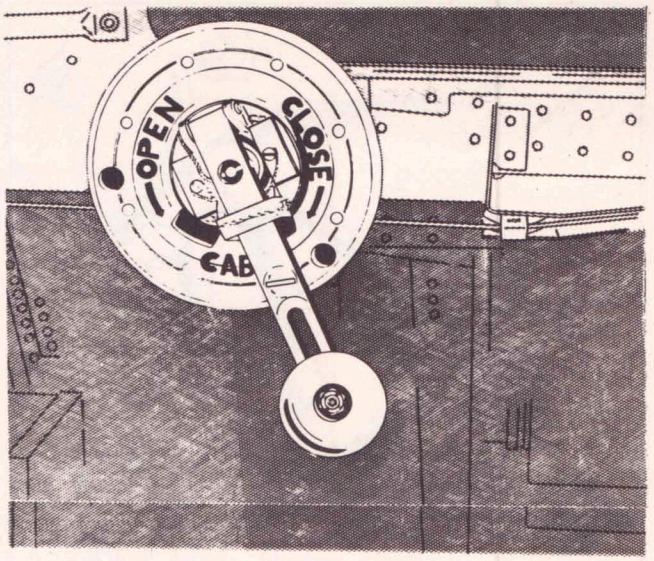


Figure 21—Gunner's Cabin Crank

battery switch is closed ("ON"), the dial will "settle out" and give a true reading. Therefore, if the attitude gyro is to be used in take-off, DO NOT TAKE OFF UNTIL THE BATTERY SWITCH HAS BEEN "ON" FOR ABOUT FIVE MINUTES AND THE DIAL HAS SETTLED OUT.

(2) When the airplane goes through a vertical climb or dive attitude, an error in reading normally less than 10° may result. This will be corrected after a few minutes of normal flight. Similarly, an error normally less than 2 degrees may be introduced in making a turn. This will also correct itself after a few minutes of normal flight.

c. TAIL WHEEL LOCK.—To facilitate taxiing, the tail wheel should be unlocked. (See Section II, paragraph 7e.) The control for locking the tail wheel is marked "TAIL WHEEL LOCK" and is located on the left console. *(See figure 46.)* To lock the tail wheel, move the control lever to the bottom of its slot, marked "LOCK". To unlock, move the lever up and forward to the end of the slot, marked "UNLOCK."

d. WINDSHIELD DEFROSTER AND COCKPIT HEATER.—An "ON-OFF" switch marked "C'PIT HEATER" *(see figure 5)*, is mounted on the electrical controls panel on the right console. Moving the switch to "ON" causes heated air to be blown simultaneously across the windshield, for defrosting, and into the cockpit, for heating.

e. PITOT HEATER.—The pitot tube is equipped with a resistance heater to melt ice that may form in or on the tube. An "ON-OFF" switch marked "PITOT HEATER" and mounted on the electrical controls panel *(see figure 15)*, is used to operate the heater. Flip the switch to "ON" and leave it there as long as there is any danger of ice forming around the tube.

f. ARRESTING HOOK.—This airplane is equipped with a latch type arresting hook, the control for which is on the right console. *(See figure 17.)* It consists of a handle which moves in a slot having notches at each end. When the handle is locked in the notch at the forward or "UP" end of the slot the hook is held in the up position by a latch. Moving the handle aft to the "DOWN" position of the slot releases the latch and allows the hook to drop. When releasing the hook, always lock the control lever in the "DOWN" position; otherwise, when the hook bounces up from the deck, it may engage the latch and become secured in the up position.

g. LANDING GEAR CONTROL.

(1) The control governing retraction and extension of the main landing gear is on the inboard side of the hydraulic controls quadrant. *(See figure 10.)* The extreme positions of travel of the control lever are indicated as "UP" and "DOWN". Just below the control is a lock *(See figure 10)* on which only the "UNLOCK" position is shown, which must be pushed down and aft (unlocked) before the gear can be retracted; in any other operation (extending gear) its operation is automatic.

(2) To retract the landing gear, depress the plunger in the end of the control lever and move the lock toward its "UNLOCK" position (both operations can be performed at the same time). Pull the control lever up and aft to the end of its travel, in "UP" position, and release the plunger. The lock will secure itself without adjustment. To lower the gear, depress the plunger in the control lever and move the lever forward and down to "DOWN." Movement of the lock is not necessary.

(3) A light on the left side of the instrument panel *(see figure 4)*, indicates if the landing gear has locked up after being retracted. A blue light shows when the toggle is moved to "L. WHEEL" if the left wheel is locked up; when the switch is moved to "R. WHEEL" the light shows to indicate that the right wheel is secured. The toggle will return to its off position after being moved to either "L. WHEEL" or "R. WHEEL."

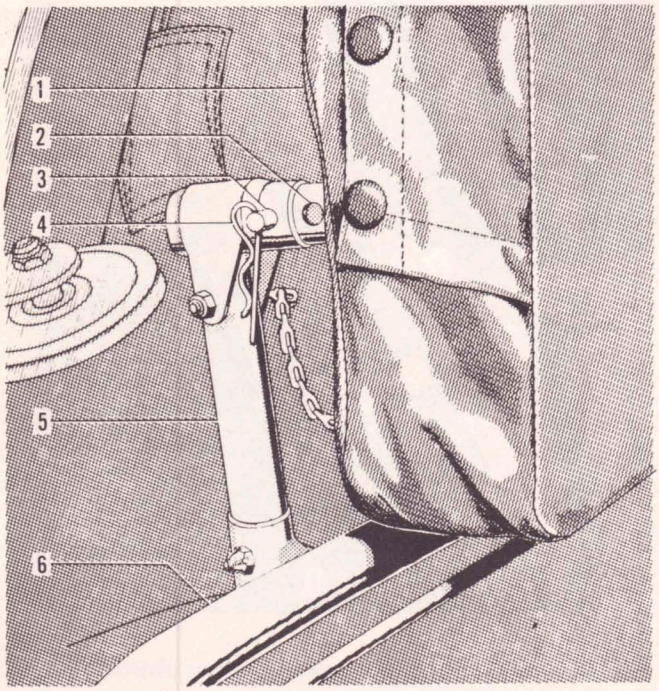


Figure 22—Pilot's Head Rest Adjustment

Parts list for figure 22.

1. Pilot's head rest
2. Adjustment hole
3. Clevis pin
4. Cotter pin
5. Bracket
6. Pilot's seat

(i) BRAKES.—The toe operated brake treadles are mounted above the rudder pedals. A brake accumulator is provided to insure effectiveness of the brakes for six to twelve applications when landing after failure of hydraulic power system. Extreme care must be exercised in such an emergency so that pressure in brake accumulator not be dissipated before landing is completed, by premature or unnecessary application of the brakes.

h. BOMB DOOR CONTROL.—The bomb door lever is on the hydraulic controls quadrant, identified by "B" on the handle. *(See figure 10).* To open the doors, move the lever to "OPEN ',hold it there until the hydro pressure gauge records normal reading (850 to 1050 psi), then place the control lever at "NEUTRAL." To close doors move the lever to "CLOSE," wait until the hydro pressure reading becomes normal, and return the control to "NEUTRAL."

Note

Bombs, or other loads carried in the bomb bay, cannot be dropped unless the bomb doors are open.

i. WINGFOLD CONTROL.

(1) To fold the wings, pull the "L" shaped handle of the manual wingfold pin control *(see figure 18)* fully aft until it locks. Then move the hydraulic control lever *(see figure 19)* down to its "WINGS FOLDED" position.

(2) To extend wings, move the hydraulic control lever up to the "WINGS SPREAD" position. When the wings are seated, the manual wingfold pin control returns to its full forward position, but should be checked by pushing forward on the handle to make certain it is secure.

WARNING

Do not fold or extend wings with the wing flaps open. To do so will cause severe damage to the flap mechanism.

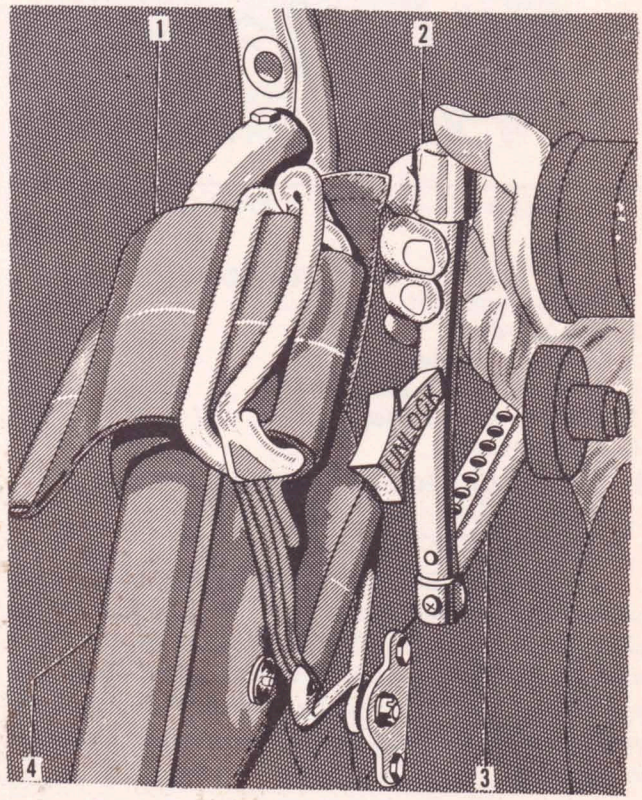


Figure 23—Pilot's Seat Adjustment

Parts list for figure 23.

1. Pilot's safety belt
2. Seat adjustment lever
3. Seat support, showing adjustment holes
4. Seat

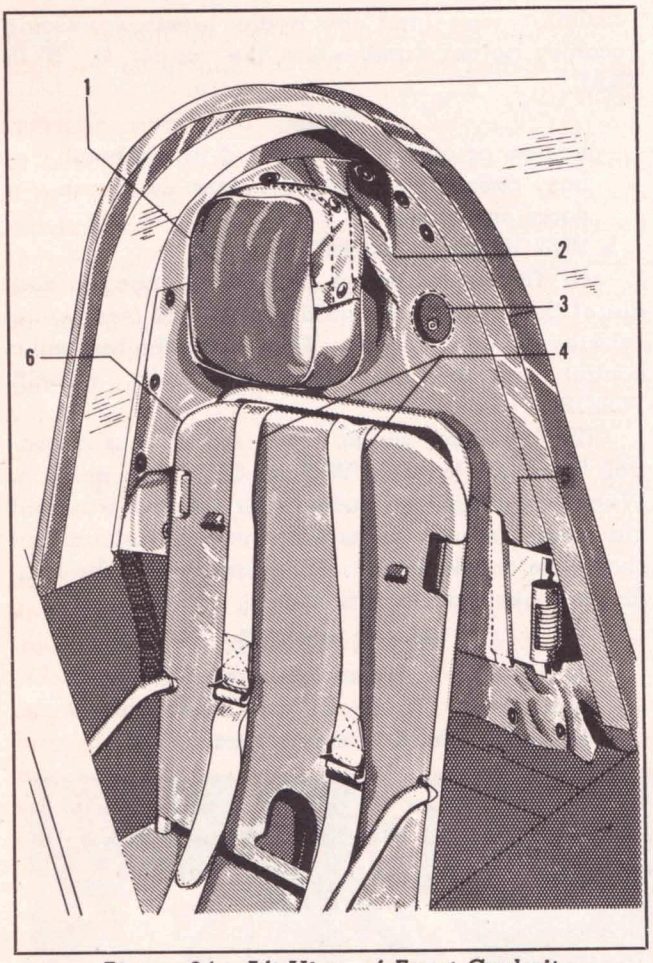


Figure 24—Aft View of Front Cockpit

Parts list for figure 24.

1. Pilot's head rest
2. Windscreen
3. Warning howler
4. Pilot's shoulder harness
5. Writing pad holder
6. Pilot's seat

9. MISCELLANEOUS CONTROLS AND EQUIPMENT.

a. PILOT'S COCKPIT.

(1) PILOT'S COCKPIT VENTILATION.—The tee handle control *(see figure 3)* for ventilation of the pilot's cockpit is located at the front of the left console, below the wingfold control. For fresh air ventilation, pull the handle aft until the desired ventilation is obtained; then turn counterclockwise to lock.

(2) PILOT'S COCKPIT ENCLOSURE.—The pilot's cockpit enclosure is operated by means of a crank and drum mounted on the right hand sill immediately above the right console. *(See figure 20.)* Clockwise rotation of the crank opens the enclosure; counterclockwise rotation closes it. In order to prevent accidental closing of the enclosure during unusually hard or emergency landings, and consequent hazard to the pilot in hampering his quick escape from the cockpit, an automatic locking device is installed on the truck and carriage assembly to lock the enclosure when it is full open. (The enclosure may be locked at each rotation of the crank, but POSITIVE locking can only be accomplished at fully open or fully closed positions.)

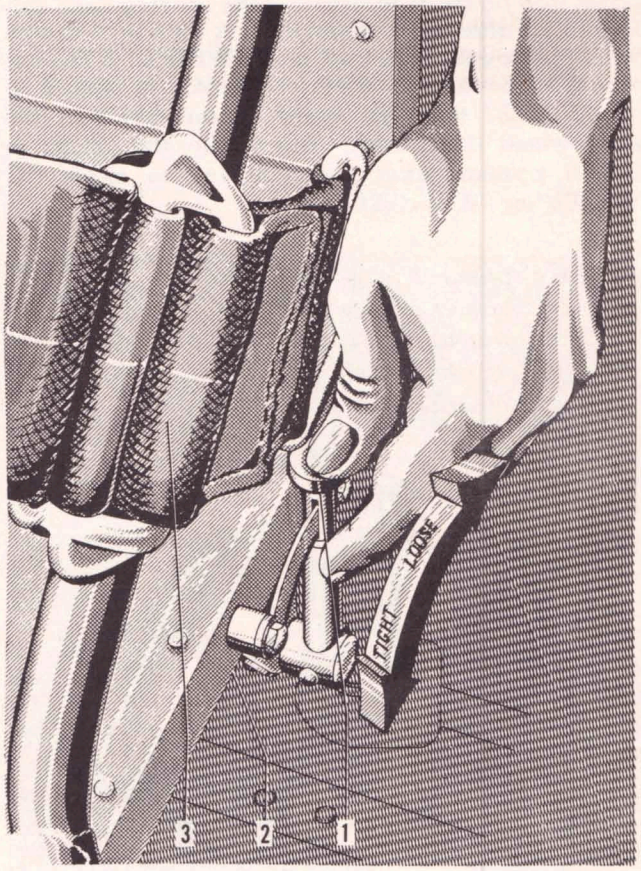


Figure 25—Pilot's Shoulder Harness Adjustment

Parts list for figure 25.

1. Shoulder harness adjustment lever
2. Pilot's seat
3. Safety belt

(3) PILOT'S SEAT ADJUSTMENT.—The seat is held in position by locking pins. For vertical adjustment, release the locking pins by raising the lever on the right side of the seat *(see figure 23)* and either raising the seat by relieving it of weight, allowing the shock cord suspension to move it up, or lowering it by applying sufficient weight to overcome the force of the shock cord. When the desired vertical adjustment is obtained, lower the lever to lock the seat in place. Horizontal adjustments are not obtainable.

(4) PILOT'S HEADREST.—The headrest must be used during catapulting operations. It is adjustable

in the fore and aft position, as follows:

(a) Remove cotter from pin which locks the tube on the headrest to the support. *(See figure 22.)*

(b) Move headrest fore and aft until the hole in the support is in line with the proper hole in the tube.

(c) Replace pin and cotter.

(5) CHARTBOARD.—The chartboard and chart drawer are under the flight instrument panel. To pull the chartboard and drawer out together, pull down the plunger and pull out the knob. To open the chart drawer without pulling out the board, move the catch to the left and pull aft.

(6) MAP CASE.—The pilot's map case is located on the inboard face of the right console. *(See figure 26.)*

(7) PILOT'S RELIEF TUBE.—The relief tube is stowed on a bracket aft of the right console, from which the tube can be easily removed.

(8) PILOT'S WATER CANTEEN.—The water canteen is stowed in a canvas container mounted on the aft end of the right console.

(9) WRITING PAD HOLDER.—The writing pad holder consists of a metal plate having lugs on the right side and a spring clip at the top. *(See figure 27.)* It is stowed on the left side of the windscreen, just below and left of the headrest. To use, remove it from stowage and insert the two lugs into the holes provided for them on the right cabin sill.

(10) CHECK-OFF LISTS.—Check-off lists for landing and take-off are mounted on the left cabin sill. A diving check-off list is mounted on the right cabin sill.

(11) PILOT'S SHOULDER HARNESS ADJUSTMENT.—The shoulder harness can be released to allow the pilot to lean forward, or locked so that it holds the pilot's shoulders against the back of the seat. To release the harness, unlock the lever at the left side of the seat by pressing down on it and moving it aft. To lock the harness, press down on the lever and move it fully forward. ("Releasing" the harness does not mean severing or unfastening it from the seat. Instead, it consists of unlocking a spring loaded plate which is mounted behind the seat, and to which one end of the harness is attached.)

b. GUNNER'S COCKPIT.

(1) GUNNER'S COCKPIT ENCLOSURE.—The gunner's cockpit enclosure is operated by a crank and drum on the right hand sill, forward of the seat. *(See figure 21.)* Rotation of the crank counterclockwise opens the enclosure; clockwise rotation closes it. This enclosure can be locked in the open and closed positions by seating the plunger on the arm of the crank in one of the holes provided in the drum, then pushing down on the thumb latch on the crank.

Parts list for figure 26.

1. Map case
2. Pilot's seat

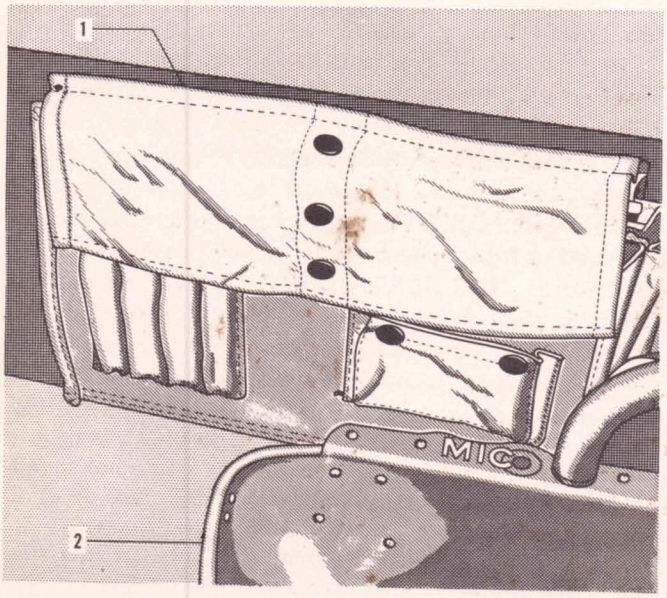


Figure 26—Pilot's Map Case

Parts list for figure 27.

1. Pilot's seat
2. Windscreen
3. Writing pad holder
4. Spring clip
5. Lug for attaching holder to cabin sill

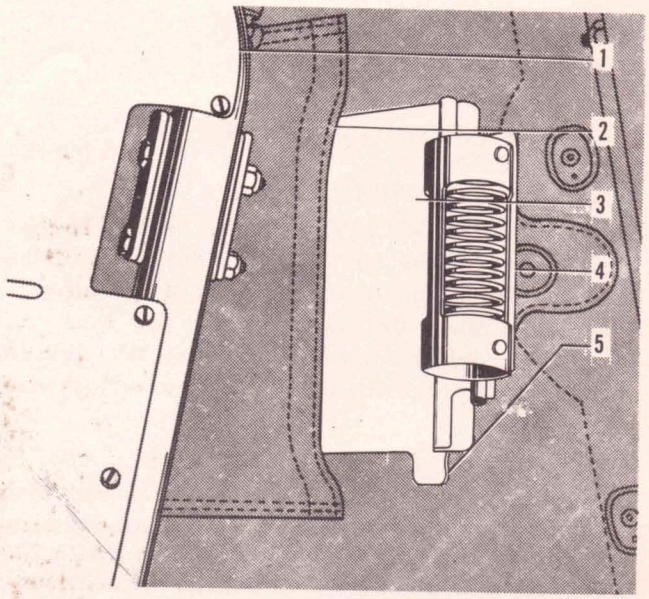


Figure 27—Writing Pad Holder

(2) GUNNER'S SHOULDER HARNESS ADJUSTMENT.—The shoulder harness can be adjusted to allow forward movement or tightened to hold the gunner's shoulders against the back of the seat. All adjustment is made by the buckle, the two shoulder straps and two lap belts being joined together and secured to a plate on the back of the seat. To release the harness unfasten the buckle, and all straps will be free.

(3) COCKPIT LIGHTS.

(a) The gunner's cockpit contains two spot lights for illuminating the instruments and radio dials. These lights are mounted on swivels and can be spotted in any desired direction.

(b) A rheostat is provided on each light to control the brilliancy. On the aft switch panel a switch is provided for intermittent lighting.

(c) The lights are controlled by a switch on the aft panel. Spare bulbs are stowed in a compartment mounted on the right side of the cockpit.

(4) DRIFT SIGNALS.—Four drift signals are carried on the floor of the aft cockpit. These signals may be dropped over the side into the water where they will burn brilliantly and allow the observer to take drift readings. Signals also provide smoke for daylight operations.

(5) RECEPTACLE.—A receptacle is provided at the lower left corner of the aft switch panel. To use, unscrew the cap, plug in whatever accessory is to be used and operate the switch. The receptacle is a source of 24 volts direct current.

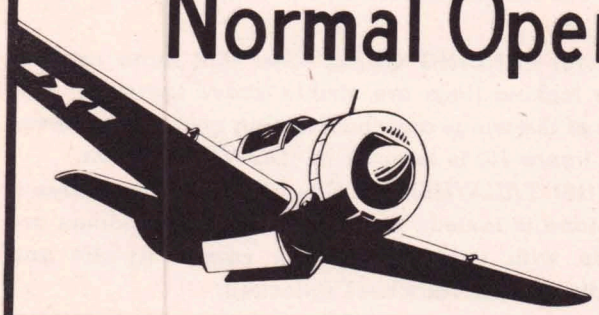
(6) WEIGHTED CONTAINER.

(a) A metal weighted container is stowed in a canvas bag mounted on the left side of the gunner's cockpit. It is easily removed from the stowage and used as a holder of restricted code books, log books, and other confidential material that would be of value to the enemy.

(b) Should it become necessary to abandon the airplane, attach the container to any part of the plane with the snap fastener on the end of the cable attached to the container. Then the container will sink with the aircraft destroying the information held therein.

(7) AIRCRAFT FILES KIT.—An aircraft files kit is located on the left side of the aft cockpit, just aft of the radio shelf. This kit is for stowage of AN publications such as the Pilot's Handbook, Erection and Maintenance Manual, etc.

Normal Operating Instructions



SECTION · II

1. BEFORE ENTERING THE PILOT'S COMPARTMENT.

a. FLIGHT LIMITATIONS AND RESTRICTIONS.

(1) MANEUVERS RESTRICTED.

(a) LOOP (WITH BOMBS OR AUXILIARY FUEL TANKS).

(b) AILERON ROLL (USE ONLY FOR ENTERING DIVE).

(c) SNAP ROLL (WITH BOMBS OR AUXILIARY FUEL TANKS).

(d) CHANDELLE (WITH BOMBS OR AUXILIARY FUEL TANKS).

(e) IMMELMAN TURN (WITH BOMBS OR AUXILIARY FUEL TANKS).

(f) INVERTED FLIGHT (USE ONLY FOR ENTERING DIVE).

(g) NORMAL SPIN (NOT OVER TWO TURNS). (WITH BOMBS OR AUXILIARY FUEL TANKS).

(h) PROLONGED SPIN.

(i) INVERTED SPIN.

(2) LIMITING INDICATED AIRSPEEDS.

(a) FOR EXTENDING LANDING FLAPS.—130 knots.

(b) FOR EXTENDING DIVING FLAPS.—240 knots.

(c) FOR EXTENDING LANDING GEAR.—175 knots.

(d) FOR OPENING BOMB BAY DOORS.—240 knots.

(3) MAXIMUM ALLOWABLE INDICATED AIRSPEEDS.

(a) DIVING SPEEDS AT ALTITUDES UP TO 10,000 FT.—350 knots.

(b) DIVING SPEEDS AT ALTITUDES ABOVE 10,000 FT.—325 knots.

Note

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

(2) BEFORE ENTERING THE COCKPIT, THE PILOT SHOULD:

(a) Check tires (90 psi if land-based; 110 psi if carrier based).

(b) Check if pitot tube cover has been removed.

(c) Check quantity of ammunition in the airplane.

(d) Check if wing gun ammunition box covers are secured.

(e) Check if fuel tank caps are secured.

(f) Check if arresting hook is latched up.

b. OBTAINING GROSS WEIGHT AND BALANCE.

(1) Check the gross weight and C. G. location for take-off, and for anticipated loading for landing. Consult Flight Charts in Appendix 1, to determine the characteristics of the airplane at the given loading condition.

(2) Loading data are furnished in the Handbook of Weight and Balance Data, AN 01-1B-40.

c. ENTRANCE TO AIRPLANE.

(1) If the front movable enclosure is open, the airplane can be entered from either side; if closed, entry must be made from the right side only, using the following procedure:

(a) Utilizing the walkway on the right wing where the wing joins the fuselage, and the handgrips provided in the side of the fuselage, walk forward on the wing to the cockpit.

(b) Push in on the access door at the lower right corner of the windshield, and slide the enclosure aft.

(c) Enter the cockpit

CAUTION

Do not step on the leveling lugs on the cockpit sill, as they are used for boresighting the wing cannons and may be bent out of alignment.

(2) The aft, or gunner's cockpit, is accessible from either side of the airplane if the rear movable enclosure is open; if closed, entry must be made as follows:

(a) Stand on the trailing edge of the walkway on the right wing, where the wing joins the fuselage.

(b) Push in on the button located in the fuselage immediately above the stencilled words "CABIN RELEASE," and slide the enclosure full forward.

(c) Utilizing the recess in the side of the fuselage labeled "STEP," enter the cockpit.

2. ON ENTERING THE PILOT'S COMPARTMENT.

a. STANDARD CHECK FOR ALL FLIGHTS.

(1) IGNITION SWITCH.—"OFF."

(2) BATTERY SWITCH.—"OFF."

(3) MASTER ARMAMENT SWITCH. — "OFF" *(see figure 38.)*

(4) GUN CHARGERS.—"SAFE" *(see figure 38.)*

(5) CHARGE GUN CONTAINERS. (PACKAGE GUNS.—"SAFE" *(see figure 38.)*

(6) MASTER ROCKET SWITCH.—"OFF" *(see figure 38.)*

(7) AUTOMATIC PILOT.—"OFF" *(see figures 3.)*

(8) CIRCUIT BREAKERS.—Pushed in.

(9) TIME CLOCK.—Wind and set the clock. *(See figure 3.)*

(10) WINGFOLD LOCK.—If wings are extended, make certain the wingfold pin flags are flush with the top surface of the wings, indicating that the locking pins are in position. The manual wingfold pin control handle must be forward as much as possible. The hydraulic wingfold control must be in the "NEUTRAL" position. If the wings are folded, the opposite of the above is true.

(11) HYDRAULIC VALVES.—"A" SHUT-OFF VALVE—"OPEN."

"B" BYPASS VALVE—"CLOSED."

(12) WING FLAPS.—The wing flaps must be closed and the indicator on the flap control lever *(see figure 10)*, at "O", if wings are extended. If the wings are folded, the flap selector must be left in whatever position it is found when the pilot enters the cockpit until the wings are extended.

(13) COWL FLAPS.—"OPEN" *(see figure 10.)*

(14) OIL COOLER FLAPS.—"OPEN" *(see figure 10.)*

(15) LANDING GEAR.—See that main landing gear locking flags are visible above the upper surface of the wings and that landing gear control lever *(see figure 10)* is secured in "DOWN" position.

(16) TAILWHEEL LOCK.—"UNLOCK" position if airplane is taxied. Land take-offs and landings are made with tailwheel locked; carrier fly-offs and landings with tailwheel unlocked.

(17) CYLINDER HEAD & OIL TEMPERATURES. —Note the cylinder head and oil temperatures in order to know which starting procedure to use. Head temperature is indicated by a dial on the lower instrument panel *(see figure 10)* and oil temperature by a gauge in the same panel. *(See figure 10.)*

(18) OXYGEN SYSTEM.—See Section V, paragraph 1.

(19) PILOT'S SEAT.—Check for correct vertical adjustment. Lock in position after adjusted properly.

(20) PILOT'S SEAT BELT & SHOULDER STRAPS. —Check for proper adjustment and security.

(21) RUDDER & BRAKE PEDALS.—Check for proper leg-length adjustment. See that pedal surfaces are even with each other.

(22) FLIGHT CONTROLS.—After the wings are spread, move the rudder pedals and control stick so that every control surface passes through its entire range of movement, to make certain nothing is impeding movement of the controls.

(23) TRIM TABS.—Tab settings depend upon wind velocity, weight of the airplane, whether catapult or running take-off, etc. Until the pilot becomes familiar with the airplane, settings of aileron 0 , elevator 0 and rudder 8 right are recommended.

(24) ENCLOSURES.—Forward and aft enclosures locked open. Visually check the jettisoning mechanism in forward enclosure for security.

(25) ARRESTING HOOK.—Locked in "UP" position.

(26) FLARES.—If a pyrotechnic pistol is installed, inspect shells for proper colors.

(27) CATAPULTING.—If airplane is to be catapulted, *the chartboard must be locked in place.*

(28) RADIO.—Refer to Section V, paragraph 3.

(29) ARMAMENT.—Refer to Section V, paragraph 2.

(30) BATTERY SWITCH.—"ON."

(31) INSTRUMENTS.—Check settings. Test setting knobs for freedom of movement.

(32) FUEL.—Check readings of the fuel gauges.

(33) ALTIMETER.—Set the altimeter *(see figure 4) to field elevation.*

(34) BATTERY SWITCH.—"OFF."

b. CHECK FOR NIGHT FLIGHTS.

(1) Complete check list as indicated by *a.* above.

(2) With battery switch "ON," turn up rheostats on the right console to test the cockpit and instrument lights.

(3) Test the section, running, recognition, and formation lights by turning the "MASTER EXTERIOR LIGHTS" switch "ON," and operating the switches.

(4) Check the approach light operation if arrested night landings are to be made.

3. FUEL AND OIL SYSTEM MANAGEMENT.

a. OPERATION OF FUEL SYSTEM.

(1) Before starting a take-off, switch the fuel selector valve to "FUSE," and turn "ON" the auxiliary fuel pump switch to insure the proper system pressure (16 to 18 psi). Use about 10 gallons from the fuselage tank to allow room for the normal vapor return of 3 to 5 gallons per hour.

(2) Switch to one of the droppable tanks using that fuel first as the tanks greatly increase drag, and cause restrictions to be placed on maneuvers. When switching tanks, turn "ON" the auxiliary fuel pump, select the proper tank on the selector and the dropwing tank electric switch, and check the fuel pressure as the auxiliary fuel pump is turned off. If the pressure drops below 16 psi, turn the auxiliary pump on again.

(3) Fuel may be drawn from either droppable wing tank but the pilot should compensate by means of the trim tabs for the loss of weight on one wing as the fuel is used. Trim tab adjustment will compensate for a full tank on one wing and an empty tank on the other. Since no gauge is provided for the droppable tanks, fuel consumption from these tanks must be determined from the elapsed time during which fuel is withdrawn.

(4) The droppable tanks are jettisoned in the same manner that bombs are released. See Section V, paragraph 2. *d.* for bomb release procedure.

(5) The auxiliary fuel pump should always be "ON" when:

(a) Starting the engine.

(b) Taking off.

(c) Climbing to operational altitude.

(d) Switching fuel tanks.

(e) Engine driven pump fails.

(f) At or above 5000 ft. altitude if a fluctuation of from ½ to 1 psi is indicated by the fuel pressure gauge.

(g) Landing.

b. OPERATION OF OIL SYSTEM.

(1) OPERATING PRESSURE.—The required system operating pressure is 80 to 95 psi, maximum pressure 95 psi, idling pressure 15 psi. The desired operating temperature is 70 to 85° C. (158° to 210° F).

(2) OIL DILUTION SYSTEM.—(For operation see Section II, paragraph 17.*c*). The system consists of an electrically operated solenoid valve, a restricted fitting, and a safety shut-off cock placed in the dilution line between the carburetor and the oil tank suction outlet leading to the oil pump. The oil dilution switch *(see figure 15)* is connected to a second solenoid which simultaneously operates a diverter valve in the system, enabling the diluted oil to bypass the cooler and return to the bottom of the oil tank near the suction outlet. The auxiliary fuel pump, being wired in series with the oil dilution system controls, operates when the oil dilution switch is turned "ON."

(a) Due to the extremely hazardous conditions existing during the process of oil dilution, it should be accomplished only by personnel thoroughly trained and familiar with the procedure. The following precautions should be observed when oil is being diluted:

1. Do not over-dilute.

2. Guard against fire.

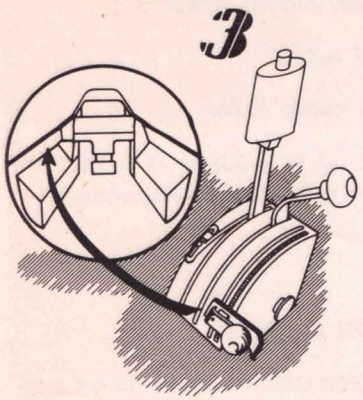
3. Dilute only when temperature below—50 C. (23 F.) is forecast.

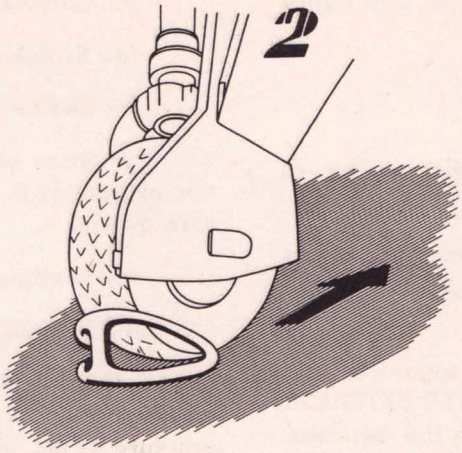
4. Allow adequate warm-up before taking off, except in cases of extreme emergency.

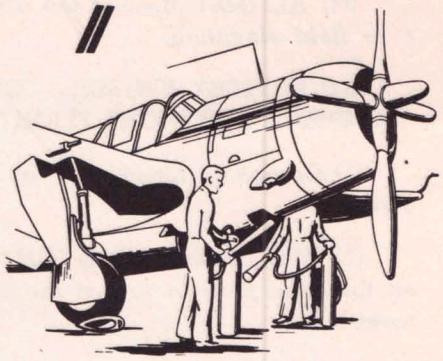
5. The oil-dilution shut-off cocks should be closed except when actually diluting oil.

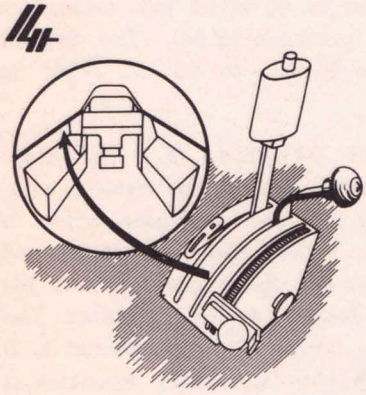
6. Keep the oil system free of sludge and water.

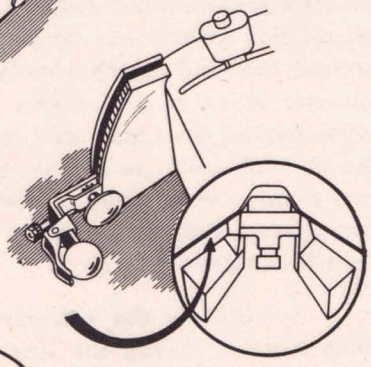
7. A normal start and warm-up without rediluting should be made if the oil has been diluted at the last operating period.

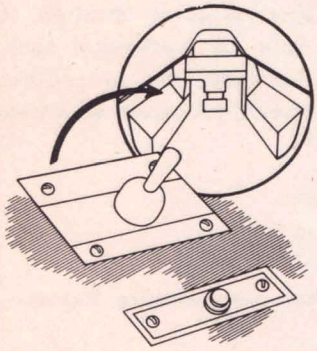


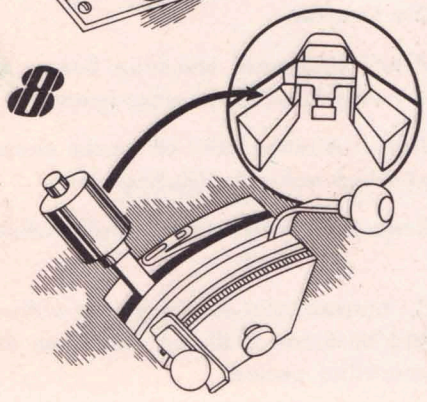


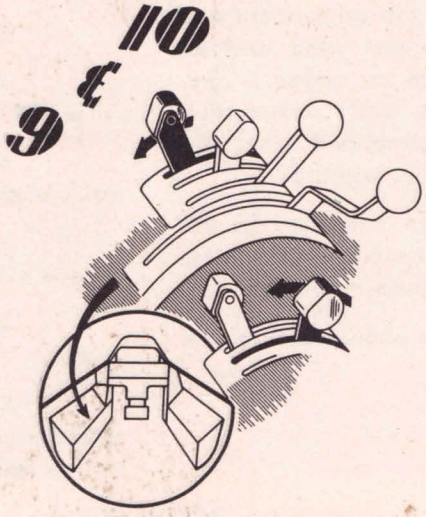


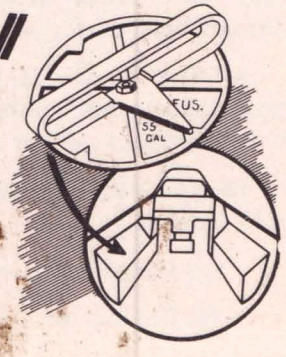












4. STARTING ENGINE.

a. STARTING PROCEDURE.

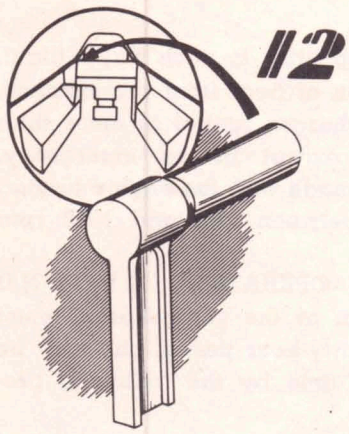
(1) IN CASE OF FIRE.—The pilot should visually check to ascertain that a member of the ground crew is on duty off his wing tip with a fire bottle before starting the engine. If an engine fire breaks out while starting, turn the fuel selector valve "OFF", switch the auxiliary fuel pump switch to "OFF", increase the throttle setting but keep the ignition switch on "BOTH" until the propeller has stopped turning. This will pull any fuel and fire in the line, ducts, and carburetor into the engine where the fuel will be ignited, partially dissipated and passed out through the exhaust with the flames. If the fire continues or shows any signs of spreading, the fire bottle should be employed by the ground crew.

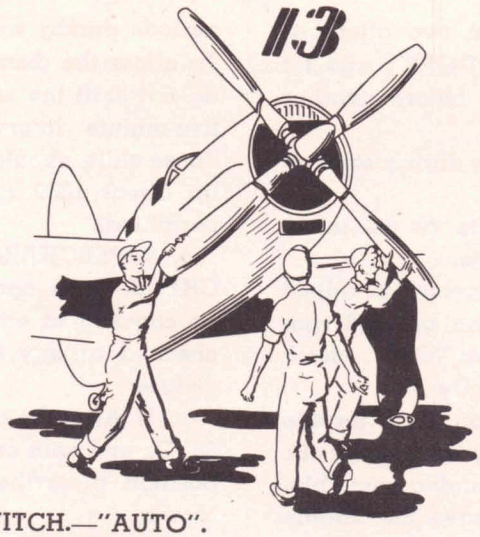
(2) See that wheels are chocked. If chocks are not available operate hand pump until approximately 800 pounds of hydraulic pressure is in system, then set brakes.

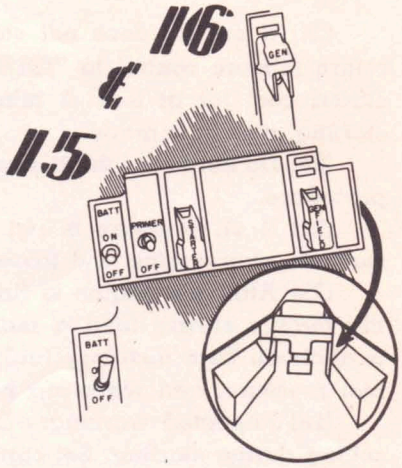
(3) MIXTURE CONTROL.—"IDLE CUTOFF".

(4) SUPERCHARGER CONTROL.—"LOW" position.

(5) PROPELLER GOVERNOR CONTROL. — Full "INCREASE RPM".







(6) PROPELLER TOGGLE SWITCH.—"AUTO".

(7) PROPELLER BREAKER BUTTON.—Pushed in.

(8) THROTTLE.—Set for 1200 rpm maximum—(open approximately ¾ inch).

(9) COWL FLAPS.—"OPEN".

(10) OIL COOLER FLAPS.—"OPEN".

(11) FUEL SELECTOR VALVE.—"FUSELAGE."

(12) CARBURETOR ALTERNATE AIR. — Direct air position (pushed forward).

(13) WITH BATTERY AND IGNITION SWITCHES "OFF", rotate propeller by hand, four revolutions in normal direction of rotation.

(14) CHECK FOR ALL-CLEAR AROUND PROPELLER.

(15) BATTERY SWITCH.—"ON".

(16) GENERATOR FIELD SWITCH.—"ON".

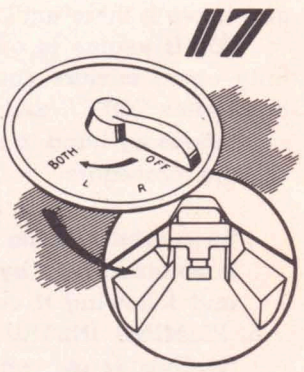
(17) IGNITION SWITCH.—"BOTH".

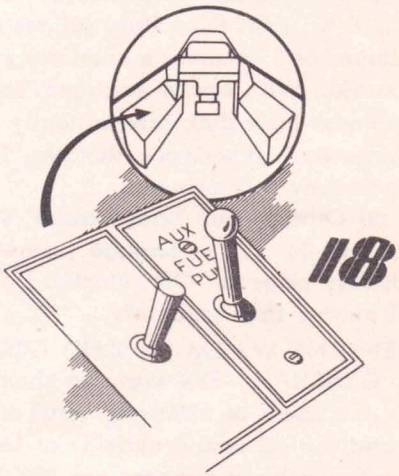
(18) AUXILIARY FUEL PUMP.—"ON".

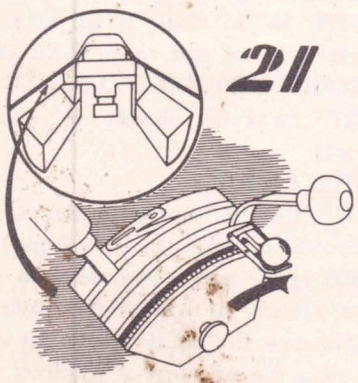
(19) PRIMER SWITCH.—"ON" (See priming instructions at end of this procedure).

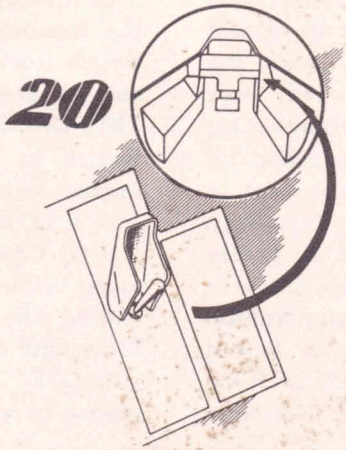
(20) STARTER SWITCH.—Hold "ON" not more than 30 seconds at any one time, wait a minimum of 30 seconds for second trial.

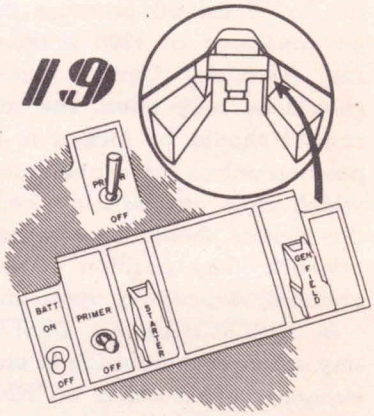
(21) Flick primer "ON" as necessary for several seconds with engine firing, and immediately move mixture control forward to "AUTO RICH."











(22) If engine does not start in two attempts, return mixture control to "IDLE CUT-OFF", and let starter cool for at least 3 minutes before another starting attempt is made.

(23) Do not touch throttle setting during starting procedure.

(24) If oil pressure is not up to 40 psi in 30 seconds, stop engine and investigate.

(25) After the engine is firing smoothly, adjust the throttle slowly until a maximum of 1200 rpm is attained. Turn auxiliary fuel pump "OFF", check fuel pressure, and warm up normally.

(26) Repeated warning: Do not touch throttle setting during starting. Set correctly as in Item (8), and leave it there until engine is running smoothly.

(27) If engine is overprimed, move the throttle fully open, mixture control "IDLE CUT-OFF", ignition switch "OFF", and rotate propeller four or five revolutions by hand in normal direction, then repeat starting procedure.

Note

Successful starting demands accuracy. It is obtained only by knowing the procedure and following it carefully.

b. PRIMING INSTRUCTIONS.

(1) Outside air temperature —30° C. to +4° C. (—22° F. to +40° F. — Hold primer switch "ON" for minimum of 3 seconds immediately prior to engaging starter. With starter engaged, hold primer "ON" 3 seconds, then flick intermittently as temperature requires and experience dictates. Higher temperatures require less priming.

(2) Outside air temperature 4° C. to 18° C. (40° F. to 64° F.) — Engage primer 3 seconds immediately prior to "ON" starter. Hold primer "ON" until engine fires smoothly.

5. ENGINE WARM-UP AND GROUND TEST.

a. GENERAL.—The warm-up should be conducted at a maximum of 1200 rpm until oil pressure is 80 psi and the oil temperature is at least 30° C. (86.0° F.), cylinder head temperature 150° C. (302° F.), 232° C. (450° F.) maximum, then open the throttle to 30 in. Hg. If the oil pressure drops, warm-up should be continued at 1200 maximum rpm. Check the fuel pressure. During warm-up, the cowl flaps should be fully open. The alternate carburetor air control should be locked in the direct (pushed in) position unless atmospheric icing conditions exist, in which case alternate air can be used. However, the control should be returned to direct air before take-off. The position of the oil cooler flaps is optional, depending upon outside air temperature.

b. SUPERCHARGER DESLUDGING. — To loosen any small accumulation of sludge and dirt, shift the supercharger clutches to "HIGH" for two 30-second periods during warm-up prior to each day's flight. To allow the dissipation of heat from the clutches, do not shift the supercharger control at more than five-minute intervals, except in an emergency. These shifts should be made with the engine turning up about 1000 rpm (between idle and 1000 rpm permitted).

c. SUPERCHARGER OPERATION GROUND CHECK.—The operation of the supercharger must be checked at each thirty-hour period but may be checked at any other time by the following procedure:

(1) After the engine oil temperature has reached 30° C., and with engine and propeller controls in the position prescribed for warm-up, shift to "HIGH" blower.

(2) Advance the throttle to obtain any selected manifold pressure between 25 and 30 inhes, allow the engine operation to stabilize, and note the rpm at the selected manifold pressure.

(3) Shift to "LOW" blower by the method prescribed for shifts during Flight Operation for the particular engine; readjust the throttle to obtain the same manifold pressure as selected in "HIGH" blower, and wait until engine operation is stabilized.

(4) If the rpm in "LOW" blower is appreciably higher than in "HIGH" blower at the selected manifold pressure, the check is satisfactory. Experience will indicate the proper difference between "HIGH" and "LOW" blower rpm at the same manifold pressure. This difference will usually be in the order of 50 to 150 rpm, depending on the manifold pressure selected.

WARNING

In order to insure that the supercharger control is in the position prescribed for take-off at the conclusion of the check and thus promote safety of flight, always perform the check by beginning in the highest ratio blower and concluding in the lowest ratio blower, as outlined above.

d. MAGNETO CHECK.—At about 2100 rpm, 30 in. Hg. maximum manifold pressure, turn the ignition switch from "BOTH" to "L" and "R" in turn, which should result in a drop of not more than 80 rpm. THIS CHECK SHOULD NOT EXCEED 30 SECONDS. Switch to "BOTH" between checks to allow the engine to clear out.

e. IDLE MIXTURE CHECK.

(1) Check the idle mixture adjustment as follows: With the throttle against the idle stop, (engine should idle at 600 rpm) move the mixture control lever with a slow, steady pull toward or into "IDLE CUT-OFF" and observe the tachometer for any increase in rpm during the process of leaning. Return

the mixture control to "AUTO RICH" before the rpm drops to a point where the engine cuts out, but do not return it before a definite drop in rpm is observed.

(2) During the leaning process, an increase of 5 rpm is considered optimum. If the increase of rpm exceeds 10, the setting is too rich. If no increase in rpm is indicated the setting is too lean and the engine may cut out when in a glide or when the throttle is advanced. If the idle mixture is not adjusted properly readjust it before taking off, if at all possible.

f. PROPELLER CHECK. — With propeller toggle switch in "AUTO" and the propeller governor lever in full "INC RPM" position, open the throttle until the engine turns about 2000 rpm. Pull the propeller governor up until about 1800 rpm or a manifold pressure of 30 in. maximum is reached. At this setting the propeller should hold the engine speed constant with no surges or irregularities. Return the governor control to full "INC RPM" position; if rpm reading is 2000, the propeller is operating properly and is ready for flight.

g. HYDRAULIC SYSTEM. — With engine running, check the hydraulic pressure gauge. This gauge should read between 850 and 1050 psi. After the wings are spread, extend and retract the wing flaps in both the "LANDING" flaps and "DIVING" flaps conditions.

CAUTION

Do not attempt to check flap operation with the wings folded.

h. AUTOMATIC PILOT GROUND CHECK PROCEDURE.

(1) Uncage bank and climb gyro.

(2) Set directional card to compass reading and uncage directional gyro.

(3) Line up reference card with directional card.

(4) Turn elevator and aileron indices to "O".

(5) Turn auto pilot valve to "BLEED".

(6) Turn rudder manual control knob one full turn.

(7) Turn manual control knobs for elevator and aileron hard over in either direction.

(The last three steps cause the hydraulic oil to bleed through the system.)

(8) Hold all controls at least 15 seconds in each extreme position, then turn rudder, elevator and aileron manual control knobs back to "O".

(9) Turn auto pilot valve "ON".

(10) Check auto pilot oil pressure; should be 155 plus or minus 20 psi.

(11) Check for air in system by operating stick and rudder pedals. If the controls have a "mushy" or "springy" feel to them, air in the system is indicated. If this condition is found, repeat steps (5) through (11), until the air is out of the system.

(12) Turn auto pilot valve "OFF".

i. GENERATOR SYSTEM CHECK.

(1) Disconnect external power source, if used.

(2) With engine idling and battery switch "ON", turn on some light electrical load, such as the cockpit or instrument lights.

(3) Slowly increase engine rpm and watch for a dip in voltage. The dip, which should occur at approximately 26.5 volts, indicates that the reverse current cut-out has closed. If the voltage does not dip, it is an indication that the cut-out has failed to close.

(4) If no voltage dip is observed by the time the voltage reaches 27 volts, make a second check by turning the battery switch to "OFF". If the cockpit instrument lights remain on, it is an indication that the reverse current cut-out closed but that the dip was not observed. Turn the battery switch back to "ON".

(5) Increase the engine rpm and observe the voltmeter. The voltage should increase to about 28.0 volts and remain at the value regardless of any further increase in engine rpm.

(6) If the reverse current cut-out does not close, or the voltmeter reading is too low (does not reach 27.5 volts) or too high (reads more than 28.5 volts) the condition should be corrected before taking off.

6. SCRAMBLE TAKE-OFF.

a. GENERAL.—If an emergency take-off is necessary, use the following control settings:

(1) PROPELLER TOGGLE SWITCH.—"AUTO".

(2) PROPELLER GOVERNOR CONTROL.—Full "INC RPM" position.

(3) CARBURETOR ALTERNATE AIR CONTROL.—Direct air position (pushed forward).

(4) MANIFOLD PRESSURE.—49 in. Hg.

(5) COWL FLAPS.—"OPEN".

(6) OIL COOLER FLAPS.—"CLOSED" until oil temperature reaches 20 C. (68 F.)

b. The oil pressure should be steady at take-off power. The oil temperature should be at least 20 C. (68 F.)

7. TAXIING.

a. FLAPS.—Since the flaps can very easily be damaged by flying debris, it is recommended that they be retracted during taxiing.

b. COWL FLAPS.—"OPEN" during all ground maneuvers.

c. OIL COOLER FLAPS.—"OPEN".

d. BRAKES.—The brakes provide adequate control for all ground maneuvers. However, they are sensitive and must be used carefully.

e. TAIL WHEEL. — The tail wheel should be in "UNLOCK" position when the airplane is being taxied except during extended cross-wind taxiing, in which case the tail wheel should be locked to relieve excessive braking action.

8. TAKE-OFF.

a. Refer to Take-off, Climb, and Landing Chart, in Appendix I.

b. CHECK-OFF LIST (LAND TAKE-OFF).

(1) FUEL SELECTOR VALVE.—"FUSE".

(2) AUXILIARY FUEL PUMP.—"ON".

(3) MIXTURE CONTROL.—"AUTO RICH".

(4) SUPERCHARGER.—"LOW".

(5) PROPELLER TOGGLE SWITCH.—"AUTO".

(6) PROPELLER GOVERNOR CONTROL. —"INC. RPM".

(7) COWL FLAPS.—"OPEN".

(8) OIL COOLER FLAPS.—"OPEN".

(9) TRIM TABS.—Aileron 0°; rudder 8° R; elevator 0°.

(10) FLAPS.—"LANDING". (See Section II, paragraph *d* (1) for flap deflection angle).

(11) CARBURETOR ALTERNATE AIR CONTROL.—Direct air position.

(12) ENCLOSURES.—Locked open.

(13) TAIL WHEEL.—Locked.

(14) MANIFOLD PRESSURE.—49 in. Hg., 2800 rpm.

c. CHECK-OFF LIST (CARRIER TAKE-OFF).

(1) Check cockpits for any loose equipment and either secure it to the airplane or remove it.

(2) FLAPS.—"LANDING", 45° deflection.
(3) FUEL SELECTOR VALVE.—"FUSE".
(4) AUXILIARY FUEL PUMP.—"ON".
(5) ENCLOSURES.—Locked open.
(6) COWL FLAPS.—"OPEN".
(7) OIL COOLER FLAPS.—"OPEN".
(8) CARBURETOR ALTERNATE AIR CONTROL.—Direct air position.
(9) MIXTURE CONTROL.—"AUTO RICH".
(10) PROPELLER TOGGLE SWITCH.—"AUTO".
(11) PROPELLER GOVERNOR CONTROL.—Full "INC RPM" position.
(12) SUPERCHARGER.—"LOW".
(13) CHART BOARD.—Locked closed.
(14) THROTTLE FRICTION CONTROL.—"INCREASE."
(15) ENGINE SPEED.—2800 rpm; manifold pressure 49 in. Hg.
(16) HEAD REST.—If airplane is to be catapaulted, the head rest adjustment must be correct for pilot's use. (See Section I, paragraph 9. *a.* (4)).
(17) TAIL WHEEL.—Locked.
(18) SHOULDER HARNESS.—Locked.
(19) PARACHUTE.—Off or unlocked.

CAUTION

Do not exceed 263° C. (505° F.) Cylinder head temperature limit for take-off.

d. GENERAL.

(1) FLAP SETTINGS.—For normal land-based operations, it is recommended that a landing flap setting of 20° be used for take-off. However, any setting from 0° to 52° may be used, the higher settings giving shorter ground distance. Take-offs with flaps retracted are easily accomplished with a small increase in run, dispensing with the inconvenience of retracting the flaps after take-off. The rate of climb immediately after take-off with flaps deflected is inferior to that with flaps retracted. Take-off with high flap setting should be made only when necessary to obtain the shortest possible deck run, and after more experience with the increased settings. The elevator trim tab should be set slightly tail heavy when the high flap setting is used.

(2) TAB SETTINGS.—The tab settings vary with the individual airplane and the loading conditions. However, it is recommended that elevator 0°, aileron 0°, and rudder 8° right be used until the pilot is familiar with the airplane.

e. MINIMUM RUN TAKE-OFF.

(1) WING FLAPS.—"LANDING" (45°).
(2) PROPELLER TOGGLE SWITCH.—"AUTO".
(3) PROPELLER GOVERNOR CONTROL.—Full "INC RPM" position.
(4) MANIFOLD PRESSURE.—49 in. Hg.
(5) Hold brakes slightly until 2800 rpm is reached.
(6) Release brakes, and allow tail to rise to near level flight attitude.

Note

The best carrier take-off results have been obtained by maintaining the airplane in flight attitude until near to becoming air-borne, when a slightly nose-high attitude is attained. This procedure provides the minimum of "settling" after leaving the deck.

(7) Take off when minimum flying speed is reached. *(See figure 49, Appendix I).* If take-off is made from an unpaved or muddy runway, the tail of the airplane should be slightly lower than indicated by (6), above.

(8) If the airplane is to be catapulted use full take-off power (2800 rpm, 49 in. Hg. manifold pressure). A 45° flap setting is recommended with tab settings of aileron 0°, elevator 0°, and rudder 8° right.

CAUTION

(1) Excessive and violent displacements of elevator surfaces should, as much as possible, be avoided immediately after becoming air-borne following catapult take-off.
(2) All controls and locking devices (chart-board, propeller governor, throttle, fuel selector, mixture control, etc.) must be in proper adjustment to overcome the force of inertia originated by the catapulting operation.
(3) The pilot's headrest must be properly adjusted for his use.

9. ENGINE FAILURE DURING TAKE-OFF.

a. In the event of failure of the engine during take-off, LAND STRAIGHT AHEAD.

b. As many as possible of the operations listed below should be performed in the order given:

(1) LANDING GEAR.—"UP" if unable to land on field from which take-off was made.
(2) LANDING FLAPS.—"DOWN".
(3) MIXTURE CONTROL.—"IDLE CUT-OFF".
(4) IGNITION SWITCH.—"OFF".
(5) FUEL SELECTOR VALVE.—"OFF".

10. CLIMB AND LEVEL FLIGHT.

a. MILITARY POWER CLIMB AND LEVEL FLIGHT.—2600 rpm 43.5 in. Hg. manifold pressure for 30 minutes (Operate in

accordance with the Power Plant Chart in Section III.)

CAUTION

Do not exceed 248° C. (478° F.) cylinder head temperature in military power.

b. **NORMAL RATED (MAXIMUM CONTINUOUS) POWER CLIMB AND LEVEL FLIGHT.**—2400 rpm, 41 in. Hg. manifold pressure. (Operate in accordance with Power Plant Chart in Section III.)

c. CRUISING.—It is recommended that all cruising operations be conducted at powers below maximum cruise (Refer to Plant Chart, Section III) for best engine economy. A cylinder head temperature of 218°c. must not be exceeded.

11. GENERAL FLYING CHARACTERISTICS.

a. CHANGING POWER.

(1) When increasing engine power, adjust first the propeller governor, then the throttle.

(2) When decreasing engine power, adjust the throttle first and then the propeller governor. If necessary, readjust the throttle slightly.

b. AUTOMATIC PILOT OPERATION. — Engage by turning the automatic pilot valve "ON". After the automatic pilot is in operation, the course-setting knob and the elevator and aileron trim knobs may be adjusted slightly if necessary to put the airplane in straight and level flight.

c. CYLINDER HEAD TEMPERATURES AND COWL FLAPS ADJUSTMENT.—The cylinder head temperatures may be controlled by the degree of opening of the cowl flaps. The following cowl flaps settings are recommended:

All ground operation.—"OPEN".
Take-off.—As required.
Climb.—As required.
Cruising.—As required.
Diving.—"CLOSED".
Landing.—"CLOSED" until landing completed.

Operation of the engine shall be such as to maintain the cylinder head temperatures within the following limits:

(1) "AUTO-LEAN" Operation:
218° C. Maximum cruise or lower powers.
232° C. Normal rated power to maximum cruise.
248° C. Military power (30 minutes max.)
"AUTO-LEAN" is recommended for use at all powers.

(2) "AUTO-RICH" operation.

Use of "AUTO-RICH" mixture will increase the fuel consumption approximately 10 to 20 gallons per hour in the cruise range, and from 5 to 8 gallons per hour at higher powers. Cylinder head temperature limits for "AUTO-RICH" operation are the same as for "AUTO-LEAN" with the following exceptions:
248° C. Normal rated power (one hour max.)
263° C. Take-off (5 minutes max.)

12. STALLS.

a. For the power-off stalling speed and characteristics at various gross weights, flap settings, etc., refer to figure 61, Appendix I.

b. A definite warning before a stall is given by the airplane, in the form of a buffeting of the tail surfaces, which is relayed to the stick. A drop of the left wing will be noticed at stalling speed.

c. The ailerons are effective at or below stalling speed.

13. SPINS.

a. Spins should be prevented by the proper use of the rudder, elevator, and throttle controls. However, should a stall not be overcome before a spin develops, the following method of recovery is recommended:

(1) Kick the rudder HARD and with a POSITIVE motion FULL against the spin and hold.

(2) After about one-quarter to one-half turn, move the elevator controls FULL forward with a POSITIVE motion.

(3) Keep ailerons in neutral.

(4) Hold controls in this arrangement positively and long enough for them to take effect. It is advisable to judge the lapse of time by the number of turns made. In the event of a vicious spin, applied controls for recovery should be held for at least five turns before attempting any other means for promoting recovery.

b. Slow and cautious movement of the controls during recovery is to be avoided, as in some cases, with such movement of the rudder and elevators, spinning will continue indefinitely; whereas, brisk and positive operation of these controls will effect recovery.

c. In order to promote ease of recovery from a spin, the elevator trim tabs should be set so as to make the airplane nose-heavy for normal spinning.

d. Use of the throttle in an attempt to recover from a bad spin, although effective at times, is very poor practice and generally should be considered as a measure to be tried only as a last resort.

e. Recovery technique for the spins entered from stalls in accelerated flight is the same as that for recovery from normal, intentional spins. However, it must be remembered that spins entered during accelerated flight will usually be much faster due to the greater speed at entry. Therefore, there is more need for rapid and positive application of recovery controls and the controls may need to be

held in the recovery position for a longer period of time.

f. TO RECOVER FROM A SPIN ENTERED IN ACCELERATED FLIGHT:

(1) Employ prompt recovery controls, as outlined in paragraph 13-a, above, and hold these controls until rotation stops.

(2) Neutralize rudder after rotation ceases.

(3) Level wings.

(4) Pull out at such a rate as to avoid placing excessive "g" loading on th airplane, thus avoiding another stall.

g. TECHNIQUE FOR RECOVERY FROM INVERTED SPINS.

(1) Cut the gun.

(2) Kick hard opposite rudder against the direction of rotation. It is mandatory that a visual determination of the direction of rotation be made by reference to the nose of the airplane. The turn indicator will show the true direction of rotation in either normal or inverted spins.

(3) Pull the stick back, neutralizing the ailerons.

(4) As soon as autorotation ceases, complete the recovery from the inverted position by either rolling out with the ailerons or completing the loop or a combination of the two.

(5) Ease the throttle on very gradually to prevent engine bearing damage, as during the evolution oil pressure will probably have been lost.

14. PERMISSIBLE ACROBATICS.

a. When carrying bombs, depth charges, and/or droppable fuel tanks, the following maneuvers are permitted:

(1) AILERON ROLL. (Only for entering dive).

(2) WING OVER.

(3) VERTICAL TURN.

(4) INVERTED FLIGHT. (Only for entering dives, but not permitted when carrying filled droppable fuel tanks.)

b. When not carrying such load items, the following acrobatics are permissable:

(1) LOOP.

(2) AILERON ROLL.

(3) CHANDELLE.

(4) IMMELMAN TURN.

(5) WING OVER.

(6) VERTICAL TURN.

(7) INVERTED FLIGHT. (Only for entering dives).

15. DIVING.

a. Caution should be observed in diving from high altitudes as the manifold pressure will build up rapidly at constant throttle setting. The throttle should be opened slowly at the completion of a dive so that the partly cooled engine will not cut out.

b. PROPELLER.-"AUTOMATIC", 2200 rpm (3100 rpm max. overspeed permissible for 30 seconds).

c. COWL FLAPS.—"CLOSED".

d. BOMB DOORS.—"OPEN".

e. WING FLAPS.—"DIVING".

f. THROTTLE.- Adjust throttle to maintain a minimum of 15 in. manifold pressure.

g. It is recommended that the airplane be trimmed nose-heavy during dives, increasing the stick force necessary in the pull-out.

h. The "SNAP PULL-OUT" shall not be used in recovering from dives nor shall abrupt movements of the controls be employed in any maneuvers at high speed.

i. Observe the following procedure in case of engine over-speeding during a dive:

(1) Close throttle.

(2) If at all possible, increase the propeller pitch.

(3) Reduce the airspeed to the minimum for a safe glide.

16. APPROACH AND LANDING.

a. APPROACH.—During descent for landing at speeds near stall with the constant speed propeller control in a high rpm (low pitch) position and throttle almost closed, the blade angle does not increase when the throttle is advanced until an engine rpm corresponding to the governor setting is obtained. Under these conditions, it has been found that the lag in the governor action will allow the propeller and engine combination to over-speed beyond take-off rpm if the throttle is opened suddenly. Therefore, move the throttle forward smoothly when necessary.

b. GROUND LANDING.

(1) RADIO.—Check for correct tower frequency.

(2) ARMAMENT MASTER SWITCH.—"OFF".

(3) GUN CHARGERS.—"SAFE".

(4) CHARGE GUN CONTAINERS (PACKAGE GUNS).—"SAFE".

(5) MASTER ROCKET SWITCH.—"SAFE".

(6) FUEL SELECTOR VALVE.—Select tank with most fuel.

(7) AUXILIARY FUEL PUMP.—"ON".

(8) SUPERCHARGER.—"LOW".

(9) MIXTURE CONTROL.—"AUTO RICH".

10) CARBURETOR ALTERNATE AIR CONTROL.—Direct (pushed in).

(11) ENCLOSURES.—Locked open.

(12) LANDING GEAR.—LOCKED "DOWN".

(13) TAIL WHEEL.—Locked.

(14) WING FLAPS.—"LANDING"—Setting 52°.

(15) COWL FLAPS.—"CLOSED".

(16) PROPELLER TOGGLE SWITCH.—"AUTO"

(17) PROPELLER GOVERNOR.—2400-2600 rpm.

(18) THROTTLE FRICTION CONTROL. — "DECREASE".

(19) Tighten lap belt and shoulder harness; lock harness.

Note

After landing and before taxiing, return wing flaps to "O" and cowl flaps to "OPEN".

c. CARRIER LANDING.

(1) ARMAMENT MASTER SWITCH.—"OFF".

(2) GUN CHARGERS.—"SAFE".

(3) CHARGE GUN CONTAINERS. (PACKAGE GUNS).—"SAFE".

(4) MASTER ROCKET SWITCH.—"OFF".

(5) FUEL SELECTOR VALVE.—Select tank with most fuel.

(6) AUXILIARY FUEL PUMP.—"ON".

(7) SUPERCHARGER.—"LOW".

(8) MIXTURE CONTROL.—"AUTO RICH".

(9) CARBURETOR ALTERNATE AIR CONTROL —DIRECT (pushed in).

(10) ENCLOSURES.—Locked open.

(11) LANDING GEAR.—LOCKED "DOWN".

(12) TAIL WHEEL.—"UNLOCK".

(13) WING FLAPS.—"LANDING"—Setting 45°.

(14) COWL FLAPS.—As required.

(15) PROPELLER TOGGLE SWITCH.—"AUTO".

(16) PROPELLER GOVERNOR CONTROL.—Set for 2400-2600 rpm.

(17) THROTTLE FRICTION CONTROL. — "DECREASE".

(18) ARRESTING HOOK.—"DOWN".

(19) Tighten lap belt and shoulder harness; lock harness.

d. CROSS WIND LANDING.—When it is found necessary to land cross wind, it is recommended that a power-on landing, slightly wheels first, be made.

e. MINIMUM RUN LANDING.—The recommended procedure for executing a minimum run landing is as follows:

(1) A carrier approach, with a 3-point landing near the end of the runway.

(2) Retract the landing flaps and apply brakes when the wheels are on the ground. Do not apply brakes so hard as to actually lock the wheels.

(3) Hold wheels on the ground by means of elevator control.

(4) During the last portion of the landing roll, the elevator will lose its effectiveness. Therefore, continue to apply the brakes hard, but not hard enough to raise the tail wheel off the ground.

(5) In event the airplane cannot be stopped by the time the end of the runway is reached, it is better to "ground loop" than to retract the landing gear. To ground loop, kick the rudder pedal hard one way or the other, keeping the aileron control neutral. This only applies when there are no obstructions or other airplanes with which collision is possible.

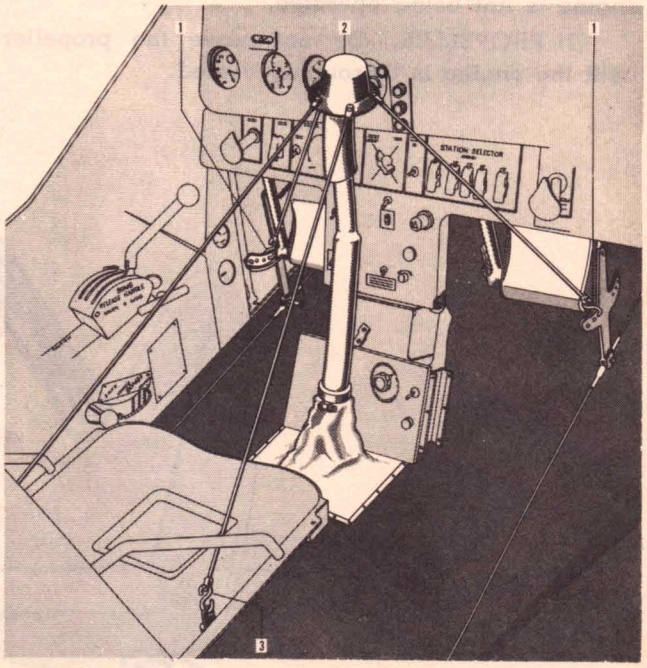


Figure 28—Parking Harness

Parts list for figure 28.

1. Rudder pedal attachment
2. Control stick attachment
3. Pilot's seat attachment

17. STOPPING OF ENGINE.

a. Before stopping the engine, idle it at about 1000 rpm until the cylinder heads have cooled. In extremely warm weather the engine may be stopped when the head temperatures have dropped to about 200°-210° C. (392°-410° F.). In cold weather allow the cylinder heads to cool to lower temperatures.

Note

If it is absolutely necessary to stop the engine before properly cooling off, throttle down to at least 1000 to 1200 rpm BEFORE STOPPING.

b. CHECK-OFF LIST.

(1) COWL FLAPS.—"OPEN".

(2) Increase the engine rpm to 1000 and operate in each blower position for 30 seconds or more. The procedure of taxiing back to the line in "HIGH" blower satisfies this requirement. Carrier-based airplanes need not desludge after flight.

(3) MIXTURE CONTROL.—"IDLE CUT-OFF". The engine should stop in a few seconds.

(4) THROTTLE.—Full open.

(5) IGNITION SWITCH.—"OFF", after propeller stops turning.

(6) FUEL SELECTOR VALVE.—"OFF", when engine is not being operated.

(7) PROPELLER.—Do not move the propeller until the engine is thoroughly cooled.

(c) Propeller in full high rpm.

(d) Turn the oil dilution "ON" and hold it for approximately two minutes.

(e) Stop the engine as soon as the dilution valve is closed by cutting the ignition and moving the mixture control into "IDLE CUT-OFF" position. This procedure is in conflict with the existing stopping procedure instructions and applies only when oil dilution system is used.

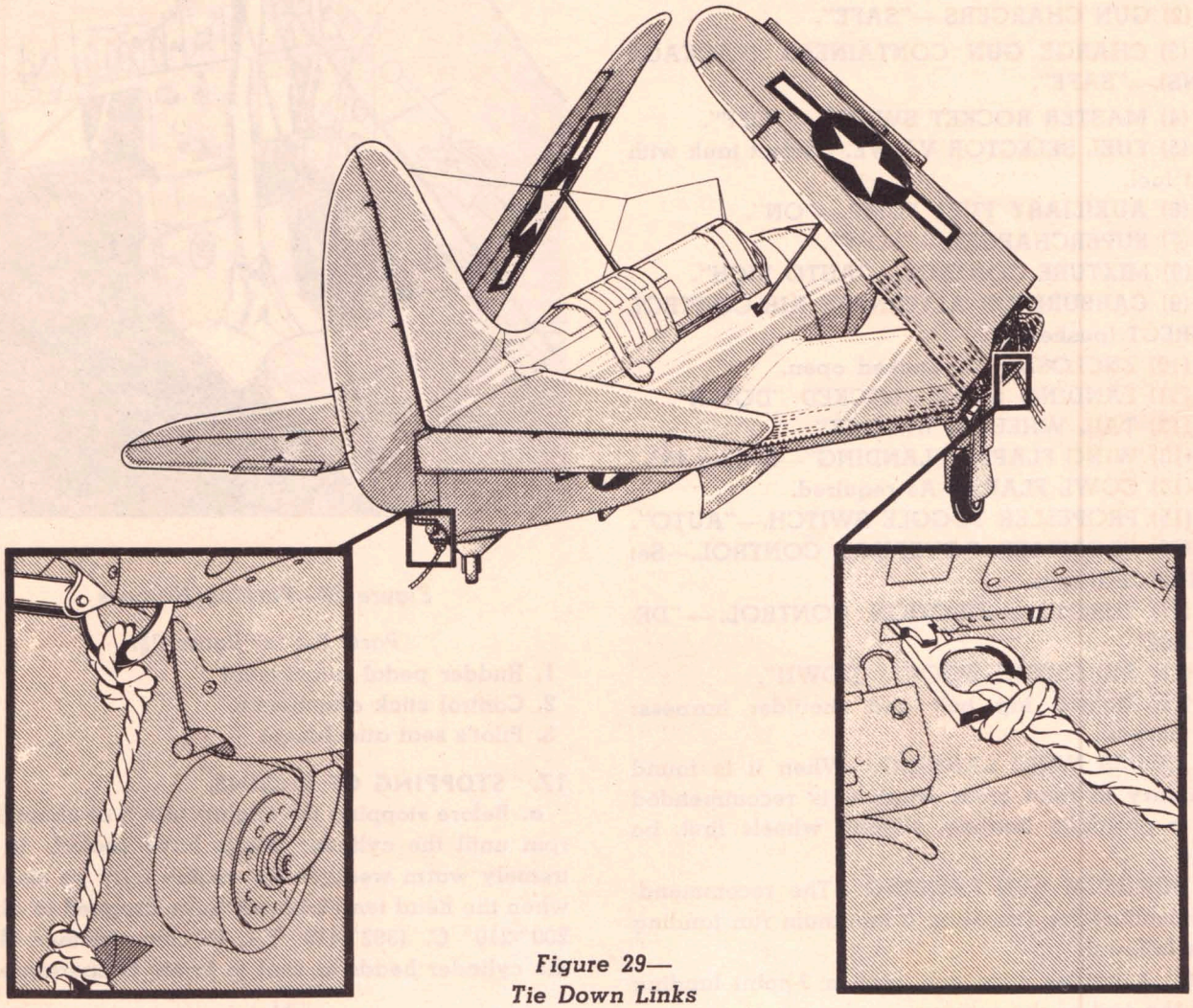


Figure 29—
Tie Down Links

c. OIL DILUTION PROCEDURE. (To be used only by personnel thoroughly familiar with oil dilution procedure and hazards).

(1) If temperatures below —5° C. (23° F.) are forecast for the period before the next start, the oil should be diluted immediately before stopping the engine by means of the following procedure:

(a) Open the shut-off cock in the oil dilution line.

(b) Hold the engine speed constant at 1000 rpm.

(f) When a cold engine is subsequently started and after running a short while the oil pressure fluctuates or drops, the dilution valve should be opened intermittently for intervals of a few seconds over a period of about fifteen seconds. If the oil pressure still does not become steady, stop the engine for about five minutes before attempting another start.

Note

There will be a notable drop in indicated fuel pressure when the dilution switch is turned "ON".

(2) PRECAUTIONS.

(a) Do not over-dilute.

(b) Guard against fire.

(c) Dilute only when temperatures below —5° C. (23° F.) are forecast.

(d) Allow adequate warm-up before taking off, except in cases of extreme emergency.

(e) The oil dilution shut-off cocks should be closed except when actually diluting the oil.

(f) Keep the oil system free of sludge and water.

(g) A normal start and warm-up without re-diluting should be made if the oil has been diluted at the last operating period.

18. BEFORE LEAVING COCKPIT.

a. Make sure that all electrical controls (battery switch, ignition switch, armament switches, lights, etc. are in "OFF" position.

b. INSTALLING PARKING HARNESS.—If the airplane is to be left unattended for any length of time the parking harness must be installed. Make the installation as shown in figure 28, attaching the adjustable end to the seat and the fixed ends to the rudder pedal adjustment plates. (The use of control surface battens is recommended, in addition to the parking harness, wherever possible).

19. MOORING.

a. TIEING DOWN.—There are three points at which the tie-down lines may be attached to the airplane. Located on the center panel just inboard of the wingfolds *(see figure 29)* are retractable tie-down rings. The catapulting hold-back shackle in the rear of the fuselage just above the arresting gear hook, *(see figure 29)* may be used to secure the tail. In extreme cases, the towing eyes on the main landing gear should be used.

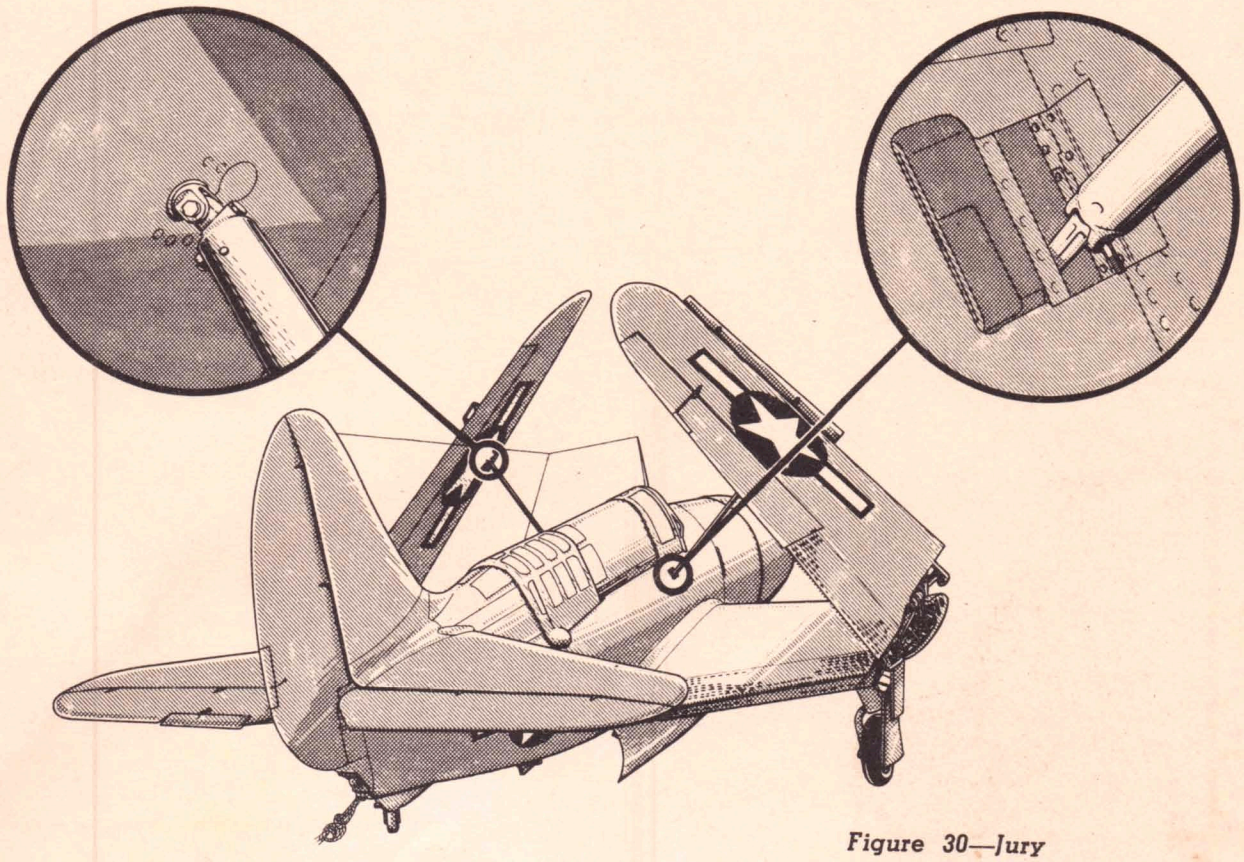
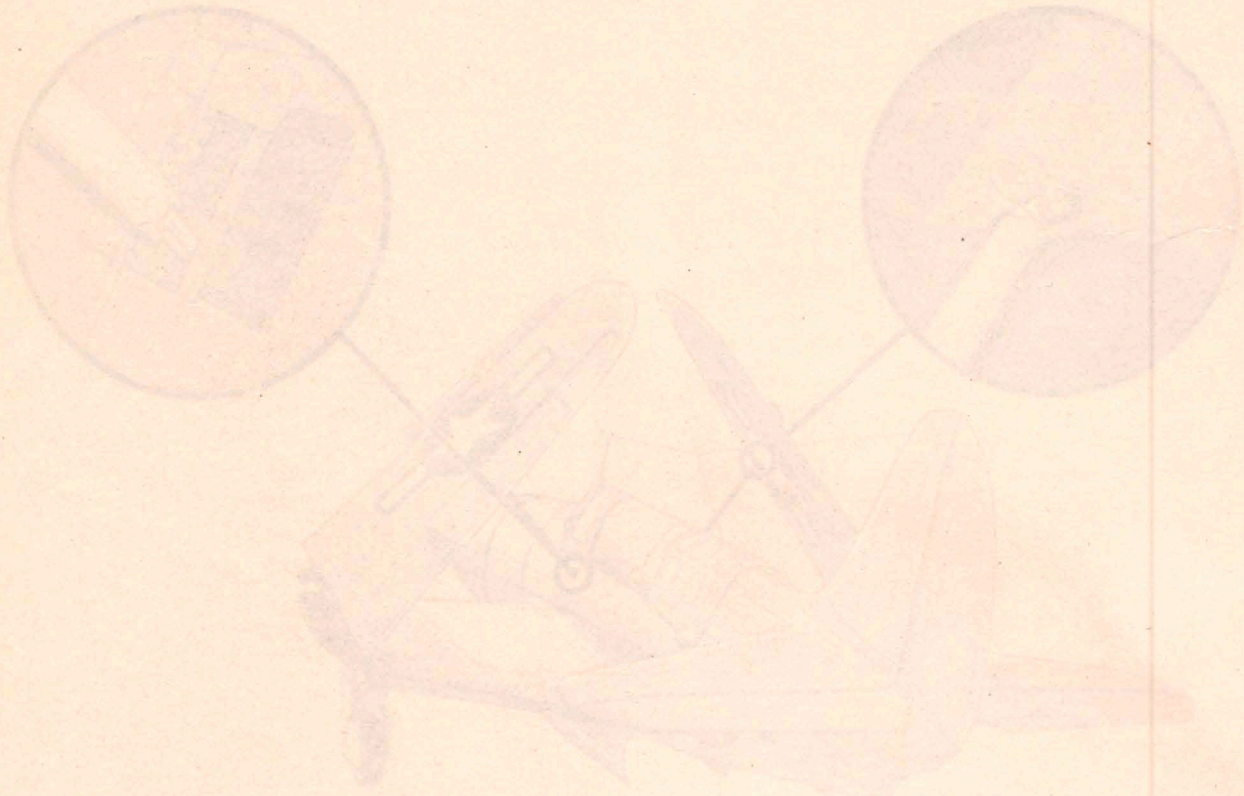
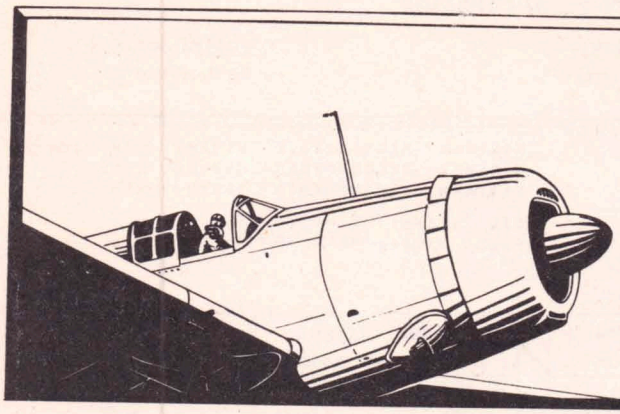


Figure 30—Jury Strut Attachments

b. INSTALLING JURY STRUTS.—If the airplane is to be parked with the wings folded, the jury struts must be installed. Swing back the cover plate over the fitting in the outer panel. *(See figure 30.)* Insert one end of the jury strut in the fitting and turn the strut one-quarter turn clockwise. Then open the little door over the fitting in the fuselage, swing out the fitting and attach the other end of the strut to it as shown in figure 30.





Operating Data
SECTION · III

The indicated airspeeds on this graph include the inherent error of the SB2C-5 airspeed indicator. They vary from calibrated airspeeds as follows:

Indicated Airspeed Knots	Calibrated Airspeed Knots
120	120
130	131
140	142
150	153
160	164
170	175
180	185
190	196
200	207
210	217
220	228
230	239

Fig. 31. Airspeed Installation Correction Table

POWER PLANT CHART

AIRCRAFT MODEL(S)
SB2C-5

PROPELLER(S)
(1) SPA-9-L 1462

ENGINE MODEL(S)
(1) R-2600-20

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.	COOLANT TEMP.		OIL[1] CONS.
DESIRED MAXIMUM	17 18	85-90 95	70-85 102			21
MINIMUM IDLING	16 10	80 15				

MAXIMUM PERMISSABLE DIVING RPM: 3100
MINIMUM RECOMMENDED CRUISE RPM:
MAXIMUM RECOMMENDED TURBO RPM:

OIL GRADE: 1120, AN-VV-O-446
FUEL GRADE: 100/130, AN-F-28

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
MINUTES			30 MINUTES 248°C			TIME LIMIT MAX. CYL. HD. TEMP.			ONE HOUR 248°C		UNLIMITED 232°C	UNLIMITED 218°C		
			AUTO-LEAN* 2600			MIXTURE R. P. M.			*AUTO-LEAN 2400			AUTO-LEAN 2200		
MANIF. PRESS.	SUPER-CHARGER	FUEL[2] Gal/Min	MANIF. PRESS.	SUPER-CHARGER	FUEL[2] Gal/Min	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH[3]	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH[3]
						-55.0 -55.0 -55.0	40,000 FT. 38,000 FT. 36,000 FT.	-67.0 -67.0 -67.0						
						-52.4 -48.4 -44.4	34,000 FT. 32,000 FT. 30,000 FT.	-62.3 -55.1 -48.0						
						-40.5 -36.5 -32.5	28,000 FT. 26,000 FT. 24,000 FT.	-40.9 -33.7 -26.5				F.T.	HIGH	90
			F.T. F.T.	HIGH HIGH	2.8 3.1	-28.6 -24.6 -20.7	22,000 FT. 20,000 FT. 18,000 FT.	-19.4 -12.3 - 5.2	F.T. F.T.	HIGH HIGH	150 170	29.0 29.0 29.0	HIGH HIGH HIGH	90 85 82
			F.T. 43.5 43.5	HIGH HIGH HIGH	3.4 3.3 3.2	-16.7 -12.7 - 8.8	16,000 FT. 14,000 FT. 12,000 FT.	2.0 9.1 16.2	39.5 39.5 39.5	HIGH HIGH HIGH	176 170 155	29.0 F.T. F.T.	HIGH LOW LOW	80 87 100
			43.5 F.T. F.T.	HIGH LOW LOW	3.4 3.4 3.5	- 4.8 - 0.8 3.1	10,000 FT. 8,000 FT. 6,000 FT.	23.4 30.5 37.6	39.5 F.T. F.T.	HIGH LOW LOW	170 180 187	32.0 32.0 32.0	LOW LOW LOW	130 122 112
			F.T. 43.5 43.5	LOW LOW LOW	3.7 3.5 3.4	7.1 11.0 15.0	4,000 FT. 2,000 FT. SEA LEVEL	44.7 51.8 59.0	F.T. 41.0 41.0	LOW LOW LOW	190 187 180	32.0 32.0 32.0	LOW LOW LOW	100 90 85

GENERAL NOTES

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

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

TAKE-OFF CONDITIONS: 2800 RPM, 49.0 IN HG.,
AUTO-RICH MIXTURE, LOW BLOWER
263°C CYL. HD. TEMP. MAX., - 5 MIN.

CONDITIONS TO AVOID:

SPECIAL NOTES

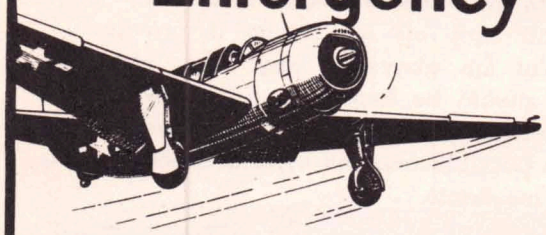
* OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS.

SUPERCHARGER TYPE: TWO SPEED - SINGLE STAGE.

AAFMC-526
4-1-44

Figure 32—Power Plant Chart

DATA AS OF 12-20-44 BASED ON PRELIMINARY DATA



Emergency Operating Instructions

SECTION · IV

1. EMERGENCY TAXIING, TAKE-OFF, AND LANDING.

a. TAXIING.—The airplane cannot be taxiied successfully without brakes, although it can be moved in a straight line if the tail wheel is locked. A brake accumulator pressure of 850 to 1050 psi is sufficient for approximately ten applications of the brakes.

b. TAKE-OFF.—The airplane can be taken off without brakes if it is possible to maneuver it into the proper position on the take-off strip.

c. LANDINGS.

(1) FORCED LANDINGS.

(*a*) It is recommended that if at all possible, the bombs, rockets, and droppable tanks be jettisoned before landing.

(*b*) A forced landing should be made well above the stalling speed, if possible, and with the landing gear retracted, in order that the pilot may have control of the plane and prevent the possibility of nosing over.

(*c*) In making a forced landing the pilot should consider the altitude, type of terrain, and characteristics of the airplane in determining the proper landing attitude.

(2) LANDING WITH WHEELS RETRACTED.—When a "belly landing" seems inevitable keep the airplane in the air until most of the fuel is consumed, then complete as much as possible of the following:

(*a*) MASTER ARMAMENT SWITCH.—"OFF" (jettison bombs, rockets, and droppable fuel tanks if possible).

(*b*) GUN CHARGERS.—"SAFE".

(*c*) SEAT BELT AND SHOULDER HARNESS.—Secured.

(*d*) ENCLOSURES.—Locked open.

(*e*) WING FLAPS.—"LANDING".

(*f*) MIXTURE CONTROL (just before landing.)—"IDLE CUT-OFF".

After the engine stops:

(*a*) BATTERY SWITCH.—"OFF".

(*b*) IGNITION SWITCH.—"OFF".

(*c*) FUEL SELECTOR VALVE.—"OFF".

(3) WATER LANDINGS (DITCHING).—The same procedure as that outlined for "LANDING WITH WHEELS RETRACTED" ((2) above), is applicable to ditching.

2. FIRE.

a. FIRE IN ENGINE COMPARTMENT.

(1) MIXTURE CONTROL.-"IDLE CUT-OFF".
(2) PROPELLER.-"HIGH PITCH".
(3) THROTTLE.-"CLOSED."
(4) FUEL SELECTOR VALVE.-"OFF".
(5) IGNITION.-"OFF"
(6) CARBURETOR ALTERNATE AIR CONTROL.-Direct (push forward).
(7) GENERATOR SWITCH.-"OFF".
(8) COOLING FLAPS.-"OPEN".

b. FIRE IN THE AIRPLANE, BUT OUTSIDE THE COCKPIT.—Close the enclosure and do not open it until abandoning the airplane.

c. PROCEDURE IN THE EVENT OF FIRE FED BY HYDRAULIC OIL IN WING AND/OR BOMB BAY DURING FLIGHT.

(1) "A" HYDRO VALVE.—Closed.

(2) FLAP ACTUATOR LEVER.—"NEUTRAL".

(3) If fire continues to burn, place the landing gear control handle in "DOWN" position. If it is the landing gear "up" line which is feeding the fire, it will continue to burn for a few moments due to oil being forced through the broken line by the retracting piston as the gear drops, but should cease very shortly after the landing gear is down.

d. ELECTRICAL FIRE.—If practicable, turn the switch to the circuit in which the fire takes place "OFF"; otherwise, turn off the battery and generator switches. If the fire is extinguished turn the circuits back on, one at a time, starting with the generator and battery switches. Watch for the circuit which caused the fire as it may flare up

again when the circuit switch is thrown.

Note

There are no provisions on the airplane for extinguishing fire.

3. EMERGENCY OPERATION OF HYDRAULIC SYSTEM.

a. If for any reason hydraulic pressure drops off, immediately close the shut-off ("A") hydro valve. If pressure rises after closing this valve, the landing gear and flaps may be operated in the normal manner. If pressure does not rise, use the following procedure to operate landing gear and flaps:

(1) Lock the landing gear control in "DOWN" position. Operate the hand pump until the landing gear warning flags appear above the upper surface of the wings. The gear is then safely locked down. Normally, from 80 to 100 strokes of the pump are necessary to force the gear down.

(2) If the warning flags do not appear after a reasonable amount of hand pump operation, open the hydraulic bypass ("B") valve and fly straight, with the right wing low, until the the right gear is locked down. Then fly straight with the left wing low until the left gear locks down.

(3) If the landing gear can be operated with the hand pump, it is possible that the flaps can be opened. To do this, move the flap control lever to the desired setting and operate the hand pump. If the landing gear cannot be pumped down, it is not possible to open the flaps.

Note

The only way in which a leak in a line from one of the brake treadles to the brake can be detected is by unequal braking action. Therefore, when landing after a hydraulic failure, apply brakes with extreme caution.

b. Should it be necessary to open the bomb bay doors after a hydraulic failure, proceed as follows:

(1) "A" SHUT-OFF VALVE.—"OPEN".

(2) "B" BY-PASS VALVE.—"OPEN".

(3) BOMB DOOR CONTROL HANDLE.—"OPEN".

Springs under compression will be released and open the doors.

4. EMERGENCY OPERATION OF ELECTRICAL SYSTEM.

a. If while in flight the voltammeter reads off scale at the "30" volts end, the generator switch should be turned "OFF" and the needle will then return to "0". However, this is an emergency condition and should it occur, the battery alone is carrying the load. Under this circumstance all electrical loads should be reduced to a minimum at once, since the battery cannot supply normal needs for long. The master radio switch should be immediately turned "OFF", as well as the radar search equipment (notify the radar operator by "ICS"). Turn the propeller toggle switch to "FIXED PITCH" and turn off all lights, if practicable. Operation of the above or any other electrical equipment should be kept to a minimum for the remainder of the flight, which should be terminated as soon as possible and the system checked by a competent mechanic.

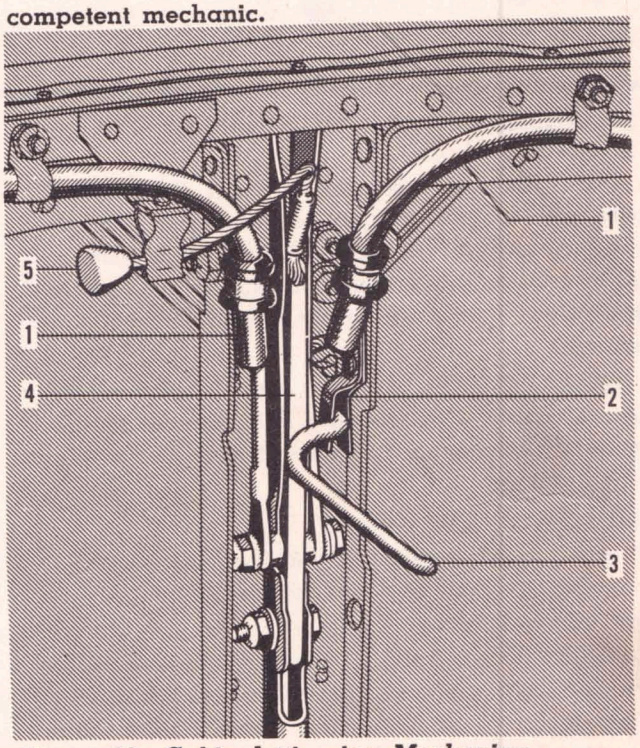


Figure 33—Cabin Jettisoning Mechanism

Parts list for figure 33.

1. Cable
2. Clip
3. Lock
4. Handle
5. Knob

To open:

(1) Pull on the locking handle.
(2) Push outboard.

5. EMERGENCY EXITS.

a. PILOT'S COCKPIT.

(1) JETTISONING THE PILOT'S ENCLOSURE.

(*a*) Pull the locking key free of the pins through which it passes.

(*b*) Pull down and aft on the release knob.

(*c*) Push the enclosure off the airplane.

WARNING

Jettisoning mechanism on airplanes Bureau number 89206 and subsequent has been rendered inoperative by bolting the cabin directly to the trucks. It is possible some

airplanes have been similarly changed in service. Pilots should visually check jettisoning mechanism to determine whether it has been rendered inoperative *(see figure 33A).*

b. GUNNER'S COCKPIT.

(1) ESCAPE HATCH.—The top of the gunner's enclosure opens to form an escape hatch. It is opened as follows:

(*a*) Rotate the locking lever 90° counterclockwise.

(*b*) Fold open the top of the enclosure.

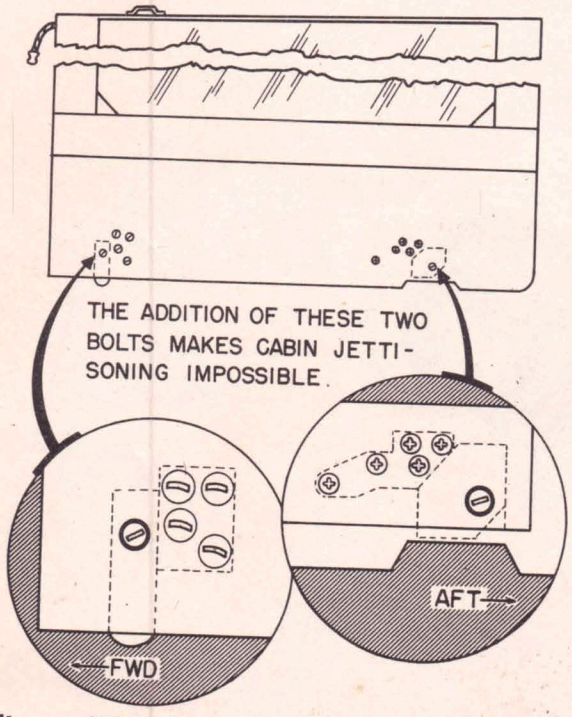


Figure 33A—Non-Jettisonable Cabin Arrangement

6. LIFE RAFT AND EMERGENCY EQUIPMENT.

a. The life raft and emergency equipment is stowed in a tube located in the fixed enclosure *(see figure 34)* forward of the gunner's cockpit, with the emergency equipment stowed forward of the raft. The procedure for removing the raft and emergency equipment, and inflating the raft, is as follows:

(1) Release lock assembly on end of stowage tube by pulling the handle *(see figure 34)* inboard.

(2) Grasp the life raft packet firmly with both hands and pull sharply aft. The emergency equipment is secured to the forward end of the raft.

(3) Continue to pull on life raft until emergency equipment packet is free of the tube.

(4) To inflate raft, follow instructions stencilled on the release flaps: "TO OPERATE—LIFT FLAP AND PULL HANDLE HARD".

WARNING

THE RAFT INFLATES INSTANTLY AFTER PULLING HANDLE. IT IS NECESSARY TO EXERCISE EXTREME CARE THAT THE RAFT DOES NOT BREAK AWAY, UPON INFLATION, AND BECOME LOST.

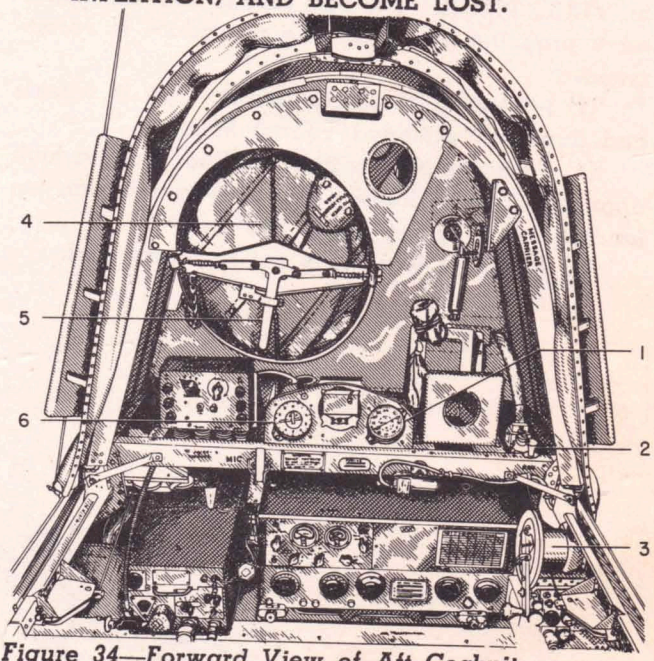


Figure 34—Forward View of Aft Cockpit

Parts list for figure 34.

1. Clock
2. Transmitting Key
3. Cabin Crank
4. Life Raft
5. Release Handle
6. Altimeter

7. POWER PLANT FAILURES.

a. ENGINE CUT-OUT IN FLIGHT.

(1) Shift fuel selector valve to a full tank, making a positive check that the dial is centered in the segment.

(2) Switch on auxiliary fuel pump.

(3) Retard throttle to ¼ open.

(4) Place mixture control in "IDLE CUT-OFF" until adequate fuel pressure (about 6 psi) is built up; then return to "AUTO LEAN" or "AUTO RICH."

(5) Nose over into steep glide to provide maximum gravity flow.

(6) Use primer if necessary.

b. PROPELLER FAILURE.—It is recommended that whenever the pilot notes that his propeller is not acting normally, i.e. the rpm unaccountably increases, decreases, or surges, that he shift his selector switch to "FIXED PITCH." This stops all

electric impulses to the propeller and will lock the blades at the pitch existing at the time of the shift. The pilot may then attempt to change rpm by moving the selector switch to "INC RPM" or "DEC RPM" depending on the desired change. If there is no response to this action, return the switch to "FIXED PITCH." For best results with an inoperative propeller, the following procedure is recommended:

(1) Jettison all external loads, and if wheels and flaps are extended, retract them.

(2) To accomplish a field landing, make a high approach and definitely come to a decision on landing before going below 500 feet.

(3) A carrier landing is not recommended.

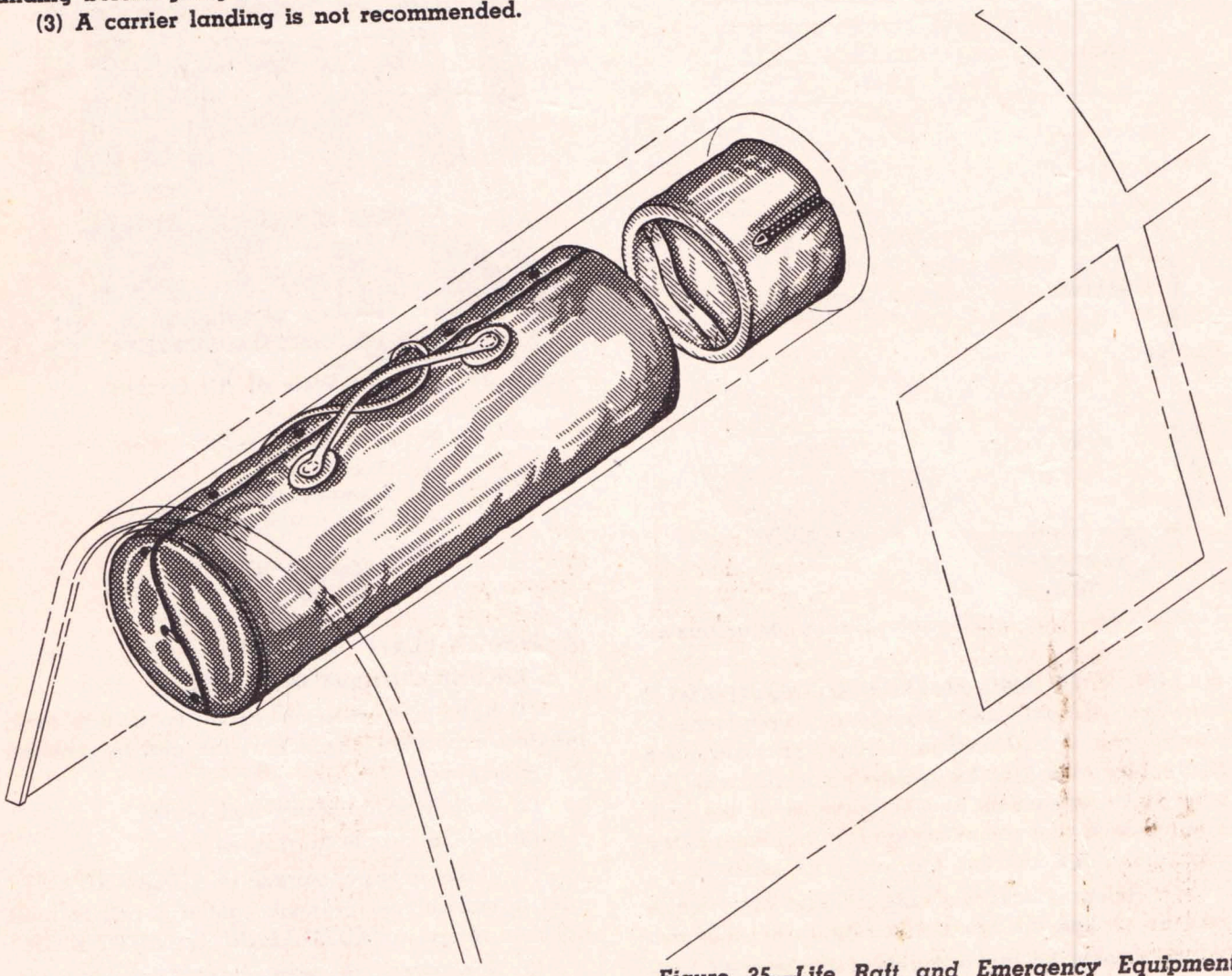
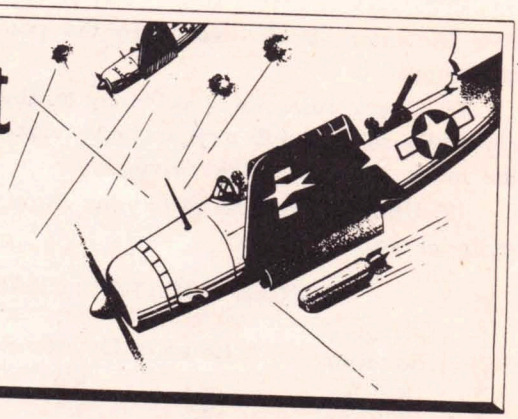


Figure 35—Life Raft and Emergency Equipment Installation.

Operational Equipment

SECTION · V



1. OXYGEN SYSTEM.

a. The oxygen system consists of two independent installations for the pilot and gunner, respectively. The oxygen installation in each cockpit consists of a diluter demand regulator, an oxygen cylinder (205 cu. in.) and an oxygen flow indicator. The oxygen masks are personal issue flight gear. Both the pilot's and the gunner's oxygen equipment is located on the right hand side of the cockpits.

b. A valve on the cylinder must be turned on in order to operate the system. When the valve is on, a gage mounted forward of the diluter demand regulator indicates the pressure in the system.

c. The diluter demand regulator has two valves—an air valve and an emergency valve. The air valve controls the flow of air from the cockpit into the regulator. Air flows into the regulator only when the valve is at "NORMAL OXYGEN". A continuous stream of oxygen is forced thru the regulator when the emergency valve is "ON".

d. In normal operation, the air valve is at "NORMAL OXYGEN" and the emergency valve is "OFF". When the pilot inhales, oxygen is drawn into the regulator where it is mixed with air from the cockpit, the ratio of air to oxygen depending on altitude and being automatically regulated by an aneroid device in the regulator. The mixture of air and oxygen flows into the mask and is inhaled by the pilot.

e. When the air valve is at "100% OXYGEN" and the emergency valve is "OFF", no air can enter the regulator and the pilot breathes pure oxygen.

f. When the emergency valve is open the pilot breathes pure oxygen; operating with the emergency valve "ON" causes the oxygen supply to be rapidly diminished and should therefore be avoided as much as possible.

g. OXYGEN FLOW INDICATOR.—The oxygen flow indicator is mounted on the instrument panel, forward of the right console. As long as oxygen is flowing thru the regulator, the indicator will "blink" open and shut each time the pilot breathes. It must be remembered that the indicator shows that oxygen—BUT NOT NECESSARILY ENOUGH OXYGEN—is flowing thru the regulator.

h. PRE-FLIGHT CHECK LIST.—The following items shall be checked while the airplane is on the ground prior to flight in which the use of oxygen is anticipated, to assure proper functioning of the oxygen system:

(1) EMERGENCY VALVE.—"OFF".

(2) Open the cylinder valve and allow at least 10 seconds for pressure in the line to equalize. The pressure gage should read 1800 plus or minus 50 psi if the cylinder is fully charged.

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

(*a*) If leakage was found by (3) above, test further, as follows: Open the cylinder valve carefully noting the pressure gage reading, then close cylinder valve. If the gage pointer drops more than 100 psi in five minutes THERE IS EXCESSIVE LEAKAGE and the system must be repaired prior to use.

(4) Check mask fit by placing thumb over end of mask tube and inhaling lightly. If there is no leakage, the mask will adhere tightly to the face due to suction created. If mask leaks, tighten the mask suspension straps and adjust the nose wire, or both. DO NOT USE A MASK THAT LEAKS.

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

(6) Open cylinder valve. Depress diaphragm knob thru hole in center of regulator case and feel flow of oxygen into the mask, then release the diaphragm knob. Breathe several times observing the

flow indicator "blink," verifying the positive flow of oxygen.

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

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

OXYGEN DURATION CHART

Pressure Reading	Hours of Oxygen Remaining		
DILUTER ON			
1800 lbs.	4.1	3.0	2.5
1500 lbs.	3.2	2.4	2.0
1200 lbs.	2.4	1.8	1.5
900 lbs.	1.6	1.2	1.0
600 lbs.	0.8	0.6	0.5
ALTITUDE	15,00 ft	20,000 ft	25,000 ft
DILUTER OFF			
600 lbs.	0.2	0.3	0.4
900 lbs.	0.5	0.6	0.7
1200 lbs.	0.7	0.9	1.0
1500 lbs.	0.9	1.1	1.4
1800 lbs.	1.2	1.4	1.8

300 lbs. PRESSURE
STAY BELOW 10,000 FEET

205 Cu. In. Bottle—AN6004-1 Dil. Dem. Regulator

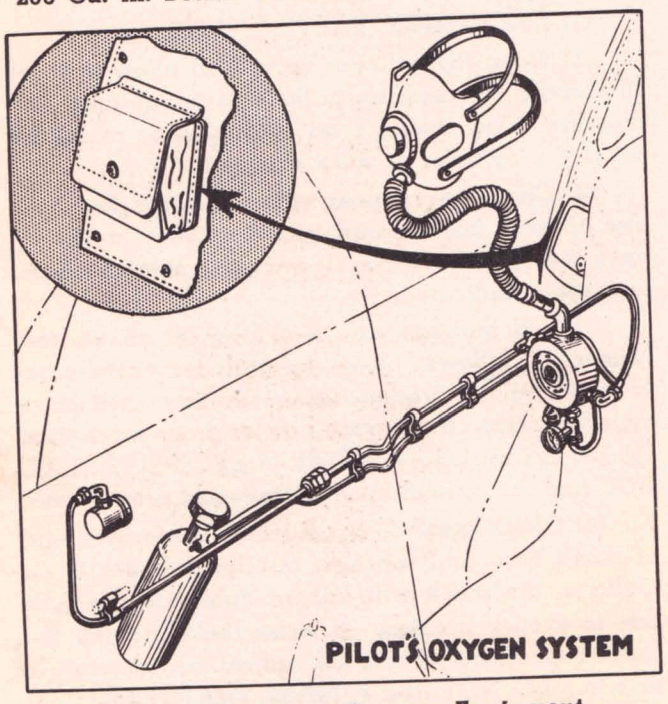


Figure 36—Pilot's Oxygen Equipment

i. OPERATION INSTRUCTIONS.

(1) Open oxygen cylinder valve. The pressure gage should read 1800 plus or minus 50 psi, if the cylinder is fully charged.

(2) Set air valve to "ON" position, except when the pressure of excessive carbon monoxide is suspected, then set to "OFF" position.

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

(4) Check mask fit by squeezing mask tube and inhaling lightly. Mask will adhere tightly to face if there is no leakage. If the mask leaks, tighten mask suspension straps.

CAUTION

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

(5) Breathe normally and observe flow indicator for "blink" verifying position flow of oxygen.

(6) Check frequently:

(*a*) Cylinder pressure gage for availability of oxygen supply.

(*b*) Flow indicator for flow of oxygen to mask.

j. All diluter demand regulators which (a) fail to meet satisfactorily the "PRE-FLIGHT CHECK LIST" above; (b) have been in service for 90 days subsequent to previous shop test; (c) are installed in airplanes undergoing major overhaul, shall be removed from the airplane and shop-tested to determine the suitability of each regulator for continued service usage.

2. ARMAMENT—PILOT'S COCKPIT.

a. GENERAL. — The following description of SB2C-5 armament covers two separate installations. The difference between "early" and "later" model airplanes are, for the most part, covered by Service Change Bulletins, which means that the airplanes delivered before these differences were incorporated in the contractor's production will be modified in the field. In order to give the pilot a clear con-

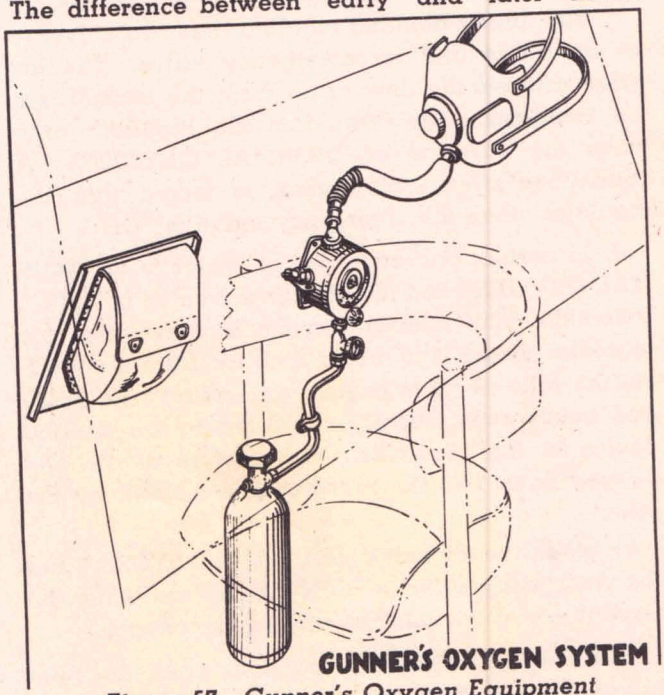


Figure 57—Gunner's Oxygen Equipment

cept of the location and use of the SB2C-5 armament controls, this description covers armament installations for both "early" and "later" models of the aircraft.

b. ARMAMENT SWITCH PANEL.—The armament switch panel is located just below the main instrument panel. *(See figure 38.)*

c. MASTER ARMAMENT SWITCH.—This switch *(see figure 38)* must be "ON" before bombs or torpedo can be armed and released electrically, the fixed cannon, rockets, or gun containers fired, and the gun camera operated. The master armament switch should be at "SAFE" at all times except when the use of some of the controls on the armament panel is intended.

d. WARNING HOWLER.—An audible warning signal located aft and left of the pilot's headrest, operates if the master armament switch is "ON" and the landing gear is in "DOWN" position. *(See figure 24.)* This serves as a reminder to turn the master armanent switch to "SAFE" during landing operation and while on the ground.

e. BOMB RELEASE.

Note

The bomb bay doors can be opened as described in paragraph 8.*h.* of Section I. Unless the doors are fully open, the fuselage bomb load cannot be dropped. A switch in the release circuit prevents closing of the circuit until the bomb doors have been opened. Maladjustment of this switch will also make release of bombs impossible even though the doors may be open.

(1) MANUAL RELEASE.

(*a*) To release bombs manually, move the "BOMB RELEASE HANDLE" on the MK. 4 Mod. 3 quadrant *(see figure 3)* aft in any of the three slots on the quadrant. The left hand slot is used for release of the left wing bomb; center for salvo of fuselage bombs and right hand slot for release of left wing bomb.

Note

The BOMB RELEASE HANDLE" will not be found on SB2C-5 airplanes Bureau No. 83373 (production number 4381) and subsequent. Therefore, only electrical bomb release is possible on airplanes above that serial number.

(*b*) Bombs may be released manually in complete salvo only by pulling up the "T" handle located below the manual bomb release quadrant *(see figure 3).*

(2) ELECTRICAL RELEASE. — Early airplanes have a "RELEASE SELECTOR" *(see figure 38)* with four positions: "OFF", SUCCESSIVE RELEASE," "SELECTED SALVO", and "SMOKE DISCHARGE". This control must be used in conjunction with the "STATION SELECTORS" switches *(see figure 38),* as with the latter switches "OFF", bombs cannot be dropped under any condition. A "STATION SELECTOR" control is provided for each bomb rack. On later airplanes the release selector has four positions indicated as "INTERVALOMETER", "OFF", "SELECTED SALVO", and "SMOKE DISCHARGE".

(3) SALVO RELEASE.

(*a*) MASTER ARMAMENT SWITCH. — "ON".

(*b*) STATION SELECTORS SWITCHES.—Select bombs to be dropped.

(*c*) RELEASE SELECTOR.—"SELECTED SALVO".

(*d*) ARMING SWITCH.—"NOSE AND TAIL" or "TAIL ONLY" as desired.

(e) Press bomb release button on control stick once. All bombs selected will be dropped.

(4) SUCCESSIVE RELEASE.

(*a*) MASTER ARMAMENT SWITCH.—"ON."

(*b*) STATION SELECTORS SWITCHES.—Select bombs to be dropped.

(*c*) RELEASE SELECTOR. — Early airplanes "SUCCESSIVE RELEASE"; later airplanes "INTERVALOMETER".

(5) SMOKE RELEASE.

(*a*) MASTER ARMAMENT SWITCH.—"ON".

(*b*) STATION SELECTORS SWITCHES. — "LEFT WING," "RIGHT WING", or both, if smoke tanks are carried on both wings.

(*c*) RELEASE SELECTOR.—"SMOKE DISCHARGE".

(*d*) Press bomb release button on control stick; smoke will be discharged from tanks.

(*c*) To jettison the smoke tanks, turn the release selector to "SELECTED SALVO" and press the bomb release button.

Note

The "ARMING" selector may be changed at any time previous to the release of the bomb(s) selected, and bombs may be returned to the safe condition by throwing the "ARMING" switch to "SAFE". All bombs are returned to the safe condition by turning the master armament switch to "OFF", regardless of the position of the arming switch.

(6) K-2 INTERVALOMETER AND SD STATION DISTRIBUTOR. *(See figure 38.)*

(*a*) These instruments should always be used in conjunction. With them it is possible to drop

bombs at predetermined intervals along the path of flight. To release bombs in this manner, proceed as follows:

1. MASTER ARMAMENT SWITCH.—"ON".

2. RELEASE SELECTOR SWITCH.—Early airplanes "OFF"; later airplanes "INTERVALOMETER."

3. STATION SELECTORS SWITCHES.—Select bombs desired to drop in train.

4. INTERVALOMETER.—Set toggle switch on "TRAIN".

a. Adjust left hand dial so that indicated speed in knots is opposite desired interval between bomb drops.

b. Turn right hand dial ("BOMBS TO BE RELEASED") clockwise to any value greater than "5".

5. STATION DISTRIBUTOR.—Set to "1" by turning rotary switch full counterclockwise.

6. Release bombs by momentarily depressing the botton switch on the control stick. It is unnecessary to hold the switch down continuously during train release as once the operation is started, it will continue until all of the selected bombs are dropped, and shut off automatically.

(7) Another method of successive release using the intervalometer and station distributor is as follows:

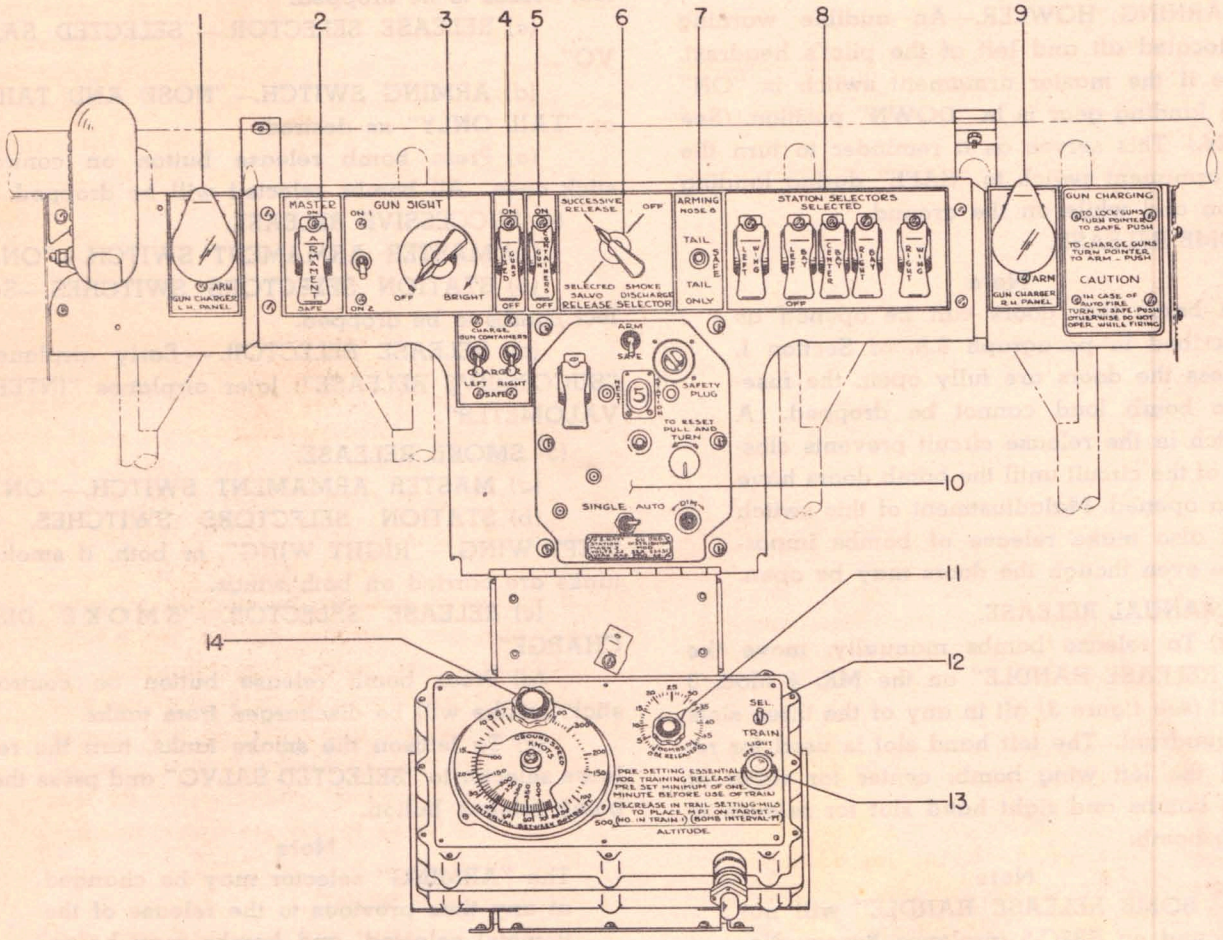


Figure 38—Armament Switch Panel

Parts list for figure 38.

1. Left gun charger
2. Armament master switch
3. Gun sight controls
4. Fixed guns switch
5. Gun containers switch
6. Rotary selector switch
7. Bomb arming switch
8. Station selector switches
9. Right gun charger
10. Mark III station distributor
11. Dial for regulating number of pulsations
12. K2-1 Intervalometers
13. Indicator light
14. Dial for setting bomb interval

(a) MASTER ARMAMENT SWITCH.—"ON".

(b) RELEASE SELECTOR SWITCH.—Early airplanes "OFF"; later planes "INTERVALOMETER".

(c) STATION SELECTORS SWITCHES.—Select bombs to be dropped.

(d) INTERVALOMETER:

1. Set toggle switch on "SEL".

2. Turn right hand dial (BOMBS TO BE RELEASED") to any value greater than the number of bombs to be dropped.

(e) STATION DISTRIBUTOR.—Set to the number corresponding to the first bomb intended to be dropped ("1" is for left wing rack; "2" left bomb boy rack; "3" center bay rack; "4" right bay rack, and "5" right wing rack).

(f) Depress the button on the control stick once for each bomb it is desired to drop. Bombs will be released in left to right order.

f. TORPEDO.

(1) The torpedo can be released electrically on all SB2C-5 airplanes and both manually and electrically on planes having the MK.4 Mod. 3 bomb release quadrant installed. For manual release, place the "BOMB RELEASE HANDLE" on the quadrant in the center slot and move it to "SALVO".

(2) Use the following procedure for electrical torpedo release:

(a) MASTER ARMAMENT SWITCH. — "ON".

(b) STATION SELECTORS CONTROLS. — "CENTER BAY".

(c) RELEASE SELECTOR.—"SELECTED SALVO".

(d) Pull up on the "T" handle on the left console, immediately above the nameplate reading "HANDLE MUST BE IN EXTENDED POSITION TO RELEASE TORPEDO", to unlock the torpedo shackle.

(e) Release torpedo by depressing the bomb release button on the control stick.

Note

Complete closure of the bomb bay doors is not possible when the torpedo, the 2000 pound bomb or the auxiliary fuel tank is carried. To close the doors as far as possible when loaded with any of the above items, proceed as follows:

1. With engine not running, open the "B" hydraulic valve to dump pressure in the main accumulator.

2. Close the "B" valve and move the bomb door control *(see figure 10)* to "CLOSED".

3. Operate the hand actuated hydraulic pump until a sudden increase in pumping effort indicates that the bomb doors are closed as far as possible.

4. Move the bomb door control to "NEUTRAL".

e. FIXED GUN INSTALLATION CONTROL.

(1) The fixed guns (20 mm cannons, one in either side of the center panel) are fired by means of the trigger on the grip of the control stick. Two hundred rounds of ammunition per gun can be carried. Since the guns are fired electrically, the master armament switch and the "FIXED GUNS" switch *(see figure 38)*, must be "ON".

(2) The fixed guns must also be charged before they can be fired. Two gun chargers, one for each gun, are located under the main instrument panel. *(See figure 38.)* To charge the guns, rotate the handles clockwise to the stops and push forward. Selective firing of the guns is accomplished by charging only the one to be fired.

(3) When the hydraulic pressure in the chargers reaches 750 psi, the handles will fly back to their original position. To release a dud or an unarmed shell, push the handle in as often as necessary. To return guns to "SAFE" turn the handle counterclockwise to stops and push forward. In the event of a hydraulic system failure the guns cannot be charged. If they have been previously charged and are on "SAFE" they may be recharged by rotating the handles clockwise to the stops, even though the hydraulic system has failed. In this condition the guns cannot be returned to "SAFE" nor will the chargers eject duds or jammed shells.

CAUTION

A run-away gun can be stopped by turning the gun charging handle to "SAFE" and depressing twice. Upon landing, the ground crew should be notified of the fact that the gun has run away so that proper precaution and corrective action can be taken. A run-away gun stopped in this manner is likely to resume automatic fire if charged.

f. PILOT'S GUN SIGHT.

(1) Early airplanes are equipped with a Mark VIII illuminated sight which can be used as a gun sight, bomb sight or torpedo director. *(See figure 40).* On later planes the sight is fixed and the reflector for the sight is incorporated as a part of the bullet-proof windshield.

(2) To unstow the sight, hold the tee handle to the left, pull aft on the sight, and turn it to a vertical position; to stow it, hold down the tee handle, rotate the sight 90° clockwise, and push it forward.

(3) To operate the sight turn the rotary knob labeled "GUNSIGHT OFF-BRIGHT" clockwise until

the desired intensity is obtained. If the gunsight lamp should burn out during operations, throw the adjacent "ON 1-ON 2" switch *(see figure 38)* to its opposite setting. The "ON 1-ON 2" positions are of equal intensity and it should be unnecessary to reset the "OFF-BRIGHT" control.

g. GUN CONTAINERS (PACKAGE GUNS).

(1) When gun containers are carried on the wing bomb racks, they are operated by means of the "GUN CONTAINERS" and "GUN CONTAINERS CHARGERS" switches. To fire the container guns select either the left container, the right container, or both, by throwing the "LEFT" and/or "RIGHT" "GUN CONTAINERS CHARGERS" switches from "SAFE" to "CHARGE". With the master armament switch "ON" throw the "GUN CONTAINERS" switch to "ON" and depress the trigger switch on the control stick. To jettison one or both containers, proceed as described under "Bomb Release" (Section V, paragraph 4d.).

(2) By combining the operations described for fixed guns and gun containers, a salvo of all guns can be fired.

h. PILOT'S GUN CAMERA.

(1) The pilot's gun camera is located in the leading edge of the right center panel, outboard of the fixed gun. The camera is actuated electrically, being automatically controlled by circuits including a switch *(see figure 38)* located on the right console circuit breaker panel, the bomb release switch, rocket launching button, and the trigger type gun-firing switches on the control stick.

(2) The gun camera, when installed, operates whenever guns are fired, bombs are released, or rockets are launched.

i. ROCKET PROJECTILES.

(1) Four rocket projectiles can be carried on each outer panel. Rockets are fired by the following procedure:

(*a*) Be sure the "SAFETY PLUG" is fully inserted in the face of the MK-3 station distributor. *(See figure 38.)*

(*b*) MASTER ARMAMENT SWITCH.—"ON".

(c) Throw the "ON-OFF" switch *(see figure 38)* on the station distributor to "ON".

(d) Turn the "ARM-SAFE" switch *(see figure 38)* to "ARM".

(e) Operate the "TO RESET PULL AND TURN" knob *(see figure 38)* until the numeral "1" appears in the "NEXT STATION" window. *(See figure 38.)*

(*f*) If it is desired to fire a single pair of rockets or a series of pairs of rockets, throw the "SINGLE-AUTO" switch *(see figure 38)* to "SINGLE".

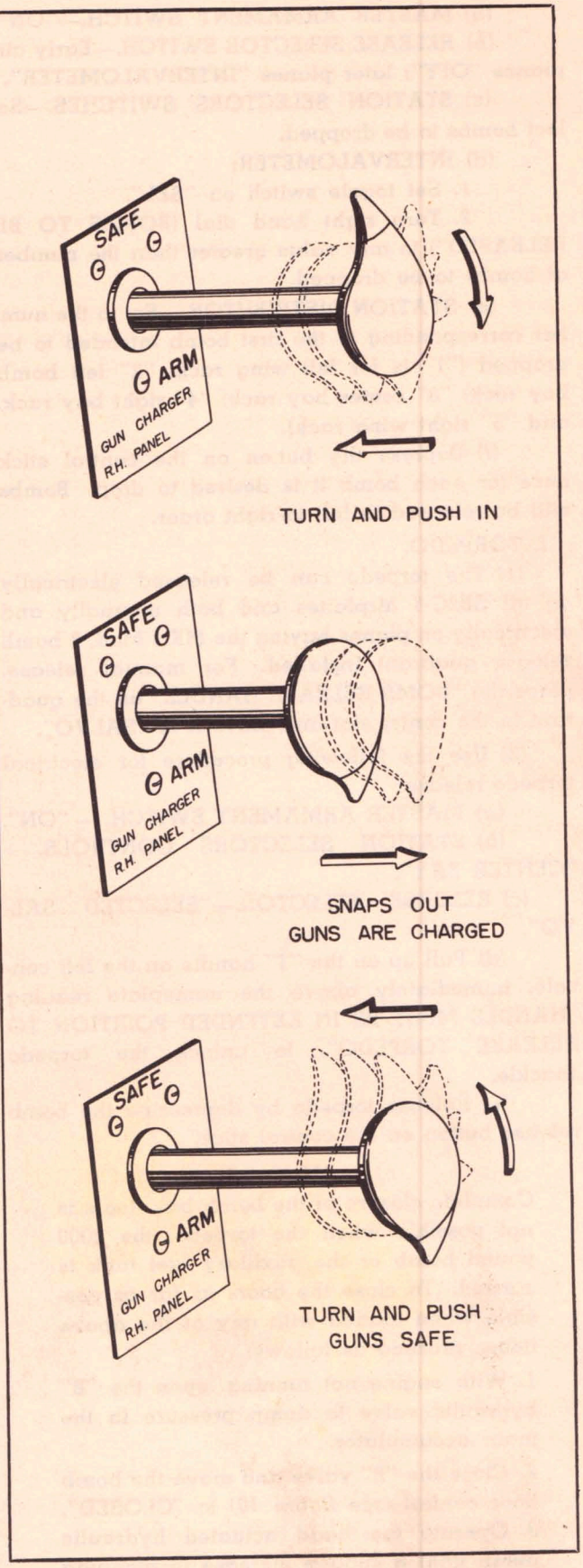


Figure 39—Gun Charger Operation

If the rapid firing of all rockets is desired, throw the "SINGLE-AUTO" switch to "AUTO". In either "SINGLES" or "AUTO" setting, the rockets will be fired in pairs going from outboard to inboard, one from each wing.

(g) Rockets are fired by depressing the switch on the left side of the control stick. With the "SINGLE-AUTO" switch at "AUTO" the firing switch must be held in continuously, as long as automatic firing is desired, or until all rockets are gone. With the "SINGLE-AUTO" switch on "SINGLE", a single pair of rockets will be released each time the firing switch on the control stick is operated.

(h) Four pairs of rockets are available, corresponding to Stations "1", "2", "3" and "4". The "NEXT STATION" window will show which station is the next to be fired. After reaching "8" the numbers will repeat in the window; i. e., "1" will follow "8", so that when four stations have been fired, all rockets are gone regardless of the "NEXT STATION" indication.

(2) To avoid burning the outer panel lower flaps when firing rockets in a dive, the "ROCKET FLAPS-DIVE FLAPS" switch *(see figure 10)* must be set to "ROCKET FLAPS" prior to operating the wing flap control *(see figure 10)* preparatory to entering a dive. If the outer panel flaps are inadvertently lowered, the rocket firing circuit is automatically opened. This condition cannot be corrected without closing the flaps by means of the wing flap control, setting the "ROCKET FLAPS-DIVE FLAPS" and reopening the flaps.

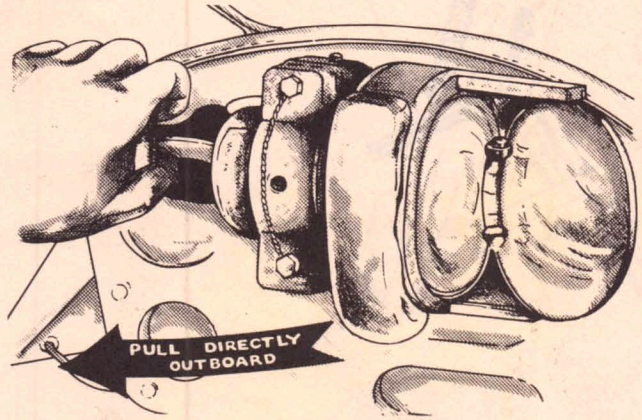


Figure 40—Unstowing Fixed Gun Sight

WARNING

DO NOT FIRE INBOARD ROCKETS BEFORE RELEASING DROPPABLE WING TANKS AS ROCKETS WILL STRIKE TANKS.

3. ARMAMENT—GUNNER'S COCKPIT.

a. FLEXIBLE GUN INSTALLATION.—The aft cockpit is equipped with a twin .30 caliber machine gun mount, manually operated. When not in use, the guns are stowed under the turtleback. *(See figure 41.)* One thousand rounds of ammunition can be carried for each gun.

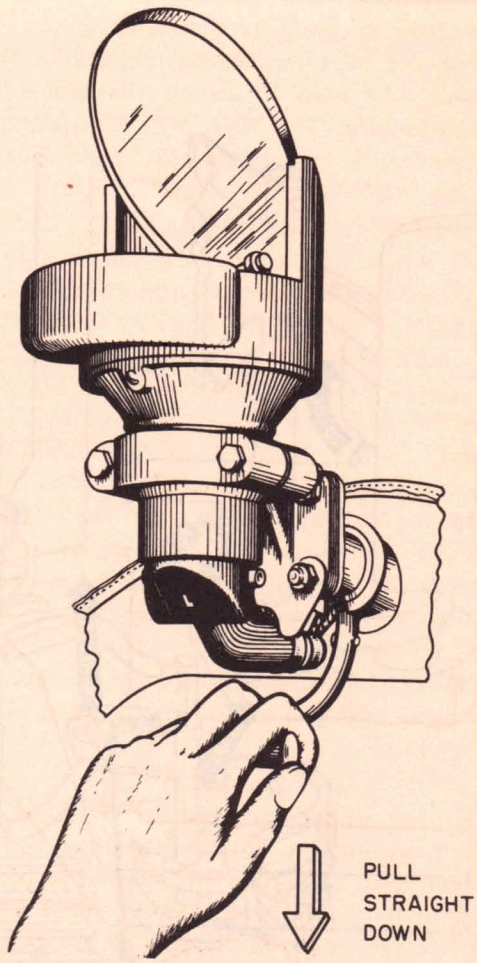


Figure 40A—Stowing Fixed Gun Sight

(1) To unstow the guns lift up the locking handles *(see figure 41)* and remove the stowage cables. Pull the guns forward until they are locked onto the carriage which rides on the mounting ring. Press down the handle and move the carriage as far as it will go to either side of the ring. The guns may now be rotated to remove the muzzles from under the turtleback.

(2) After unstowing the guns, collapse the turtleback by pushing the valve lever *(see figure 44)* and operating the hand pump. To lower turtleback rapidly open the dump valve.

(3) When the turtleback has been lowered swing the armor plate *(see figure 41)* into place by lifting up and turning the two locking keys then swinging both pieces of armor plate inboard as far as they will go. To hold the armor plate closed fasten both pieces together by the elastic cord.

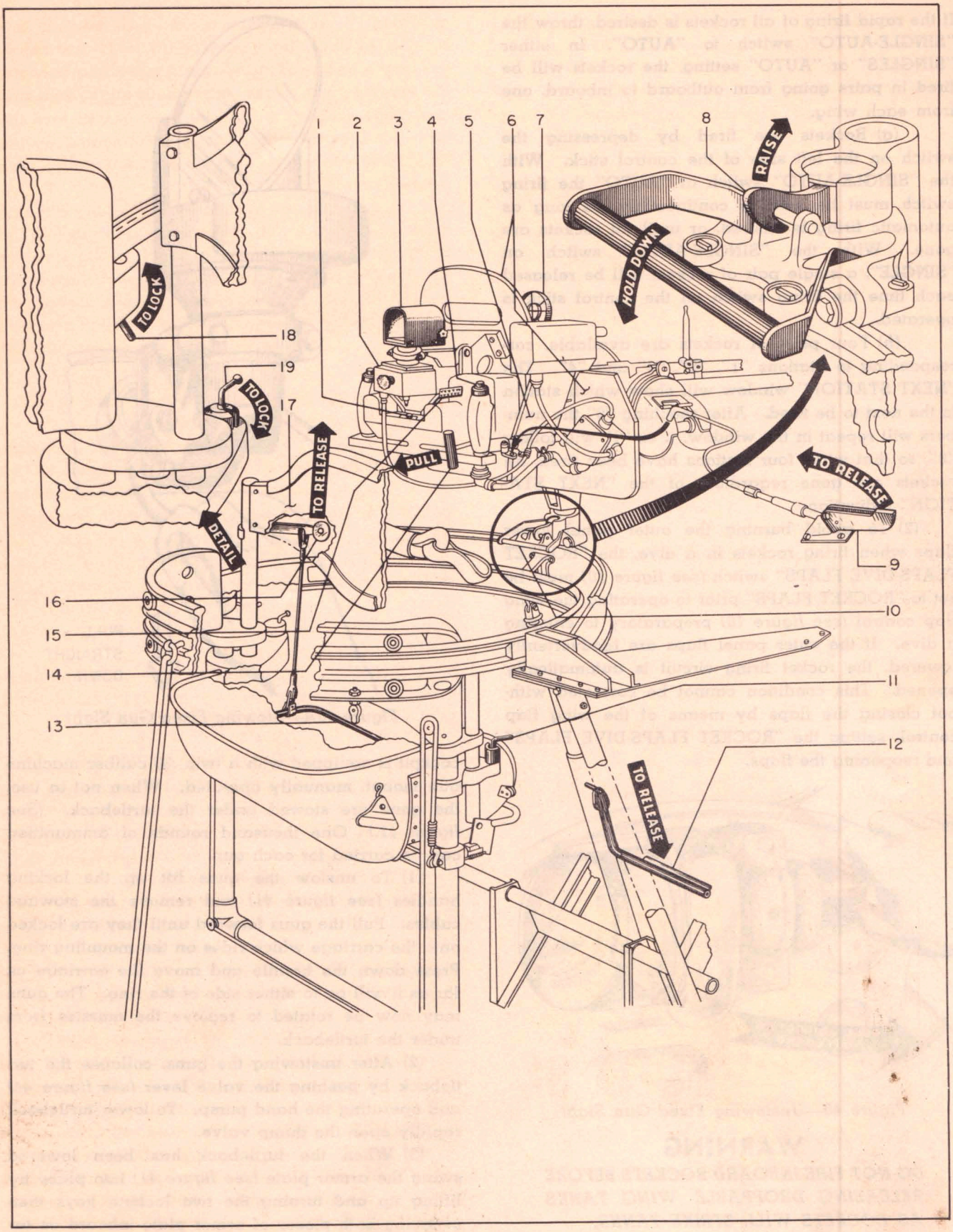


Figure 41—Flexible Gun Installation

(4) Charge the guns by pulling and releasing the two "T" handles *(see figure 41)* each of which charges one gun. To fire, place the "SAFE-FIRE" button *(see figure 41)* on "FIRE" and press the trigger *(see figure 41)* with either thumb. Selective firing is accomplished by charging only the gun it is desired to fire.

(5) The guns are manually operated and can be rotated through an arc of 35° on each side of aft center. Vertical movement is obtained by raising or lowering the guns manually. Additional vertical movement is obtained by tilting the gun track, which movement is controlled by a foot latch *(see figure 41)* on the aft supporting strut.

(6) The gunner's seat is raised or lowered by either of two methods. If the breast armor plate is in place, the seat lock is released by raising a lever on the left seat support *(see figure 41)* just inside the gun ring. If breast armor is not used, the seat lock is released by lifting a bar *(see figure 41)* just below the forward edge of the seat and extending between the seat supports. The seat revolves on the seat ring and can be locked so that the gunner can face the fore and aft positions. The lock is located on the under left side of the seat at the seat track. *(See figure 41.)*

(7) The guns are stowed by depressing a thumb latch *(see figure 41)* on the carriage and pushing the guns aft until muzzles are in place in the stowage bracket *(see figure 41)* located on the turtleback. To secure the guns in this position, place the hooks on the ends of the stowage cables in the clips provided *(see figure 41)*, just forward of the gun handles.

Note

The turtleback must be in the raised position when guns are stowed.

(8) GUN SIGHT.—In order that the gun sight light may be operated, the switch *(see figure 41)* on the aft switch panel must be "ON". After this switch is "ON" operate the multiple-type switch *(see figure 41)* on the gun mount directly below the sight.

(9) GUN CAMERA.—When the gun camera switch *(see figure 41)* is depressed, operating the trigger of the guns closes the camera circuit. The camera then operates with the guns.

Parts list for figure 41

1. "Safe" Control
2. Sight Control
3. Electric Gun Sight
4. Camera Thumb Button
5. Gun Camera Mount
6. Armor Plate
7. Alternate Sight
8. Hook—30 Caliber Gun Mount
9. Stowage Cable Release L/R
10. Governs Position of Rotating Guns on Track
11. Control for Breast Armor Plate
12. Control Lever Governing Tilt of Seat
13. Latch Rod to Elevate Seat
14. Charging Handle L/R
15. Trigger Lever L/R
16. To Raise or Lower Seat
17. Breast Armor Plate
18. Control to Lock Turret Seat on Track

4. RADIO EQUIPMENT.

a. GENERAL.—The radio navigation, communication, and other electronic equipment installed in the SB2C-5 consists of the following:

Equipment	Purpose
(1) ARB Receiver. Pilot controlled.	Provides reception on tunable LF range and HF receiver.
(2) AN/ARC-5 (Yardeny). Pilot controlled.	Provides HF reception on six pre-tuned channels.
(3) AN/ARC-1. Pilot controlled.	Provides reception and transmission on 10 preset channels.
(4) AN/ARR-2A. Pilot controlled.	Provides reception of course signals from homing transmitter on six preset channels.
(5) AN/ART-13. Pilot controlled.	Provides preset LF and HF liaison transmission on 10 channels.
(6) RL-7.	Provides amplifier for the interphone system.
(7) AN/APS-4. Radioman controlled.	Airborne radar search and beacon equipments—provides visual detection of surface targets.

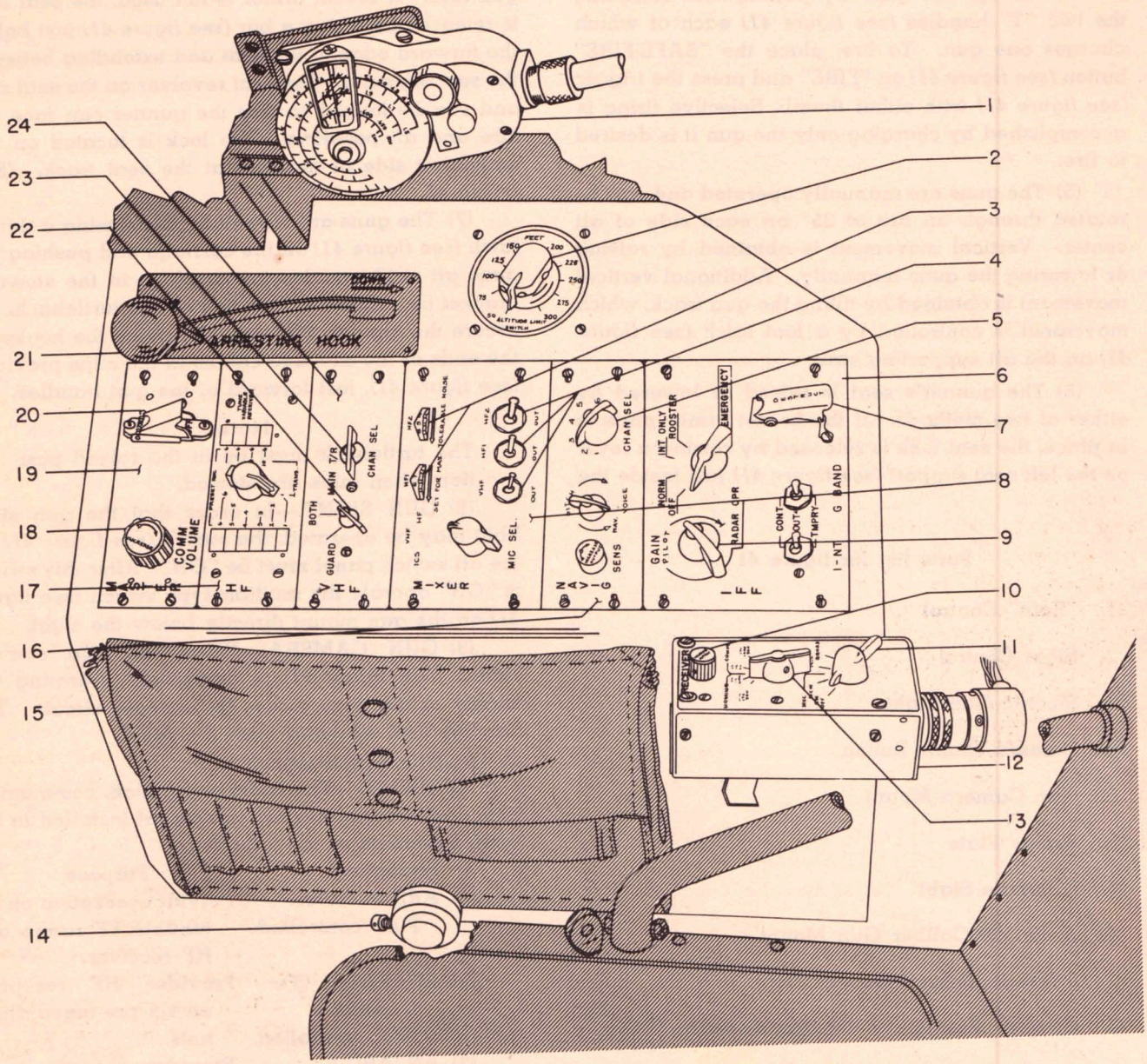


Figure 42—Aft Right Console

1. ARB tuning head
2. Altitude limit switch
3. Set for MAX. TOLERABLE NOISE, HF-1 & HF-2
4. VHF, HF-1, HF-2 switches
5. Chan-sel switch
6. IFF panel
7. DESTRUCT switch
8. MIXER panel
9. GAIN control
10. INCREASE OUTPUT control
11. MVC, AVC switch
12. ARB control box
13. HOMING-COMMUN switch
14. Microphone
15. Map Case
16. NAVIG panel
17. HF panel
18. COMM VOLUME control
19. MASTER panel
20. Master radio switch
21. Arresting hook control
22. GUARD, BOTH MAIN TR switch
23. CHAN-SEL switch
24. VHF panel

(8) AN/APX-2. IFF equipment. Pilot controlled.

(9 AN/APN-1. Provides direct indication of altitude. Pilot controlled.

b. PILOT'S RADIO INSTRUCTIONS.

(1) UPON ENTERING COCKPIT.—Plug the headset into the phone extension cord leading to the jack box. Make certain that the microphone and headset plugs are fully engaged. If the use of a mask or lip microphone is anticipated, connect either one to the mask microphone cord.

(2) POWER FOR RADIO.—With the battery switch "ON," engine running and generator charging, turn on the radio master switch located on the "MASTER" panel. *(See figure 42.)* This supplies power to the radio and interphone equipment in the airplane. While waiting about one minute for the equipment to warm up, turn off all audio outputs by the following procedure: On the "NAVIG" panel *(see figure 42)*, turn the "SENS" control counterclockwise to minimum. Throw the toggle switches on the "MIXER" panel *(see figure 42)* marked "VHF," "HF-1," and "HF-2," to "OUT." In the ferry installation, the "INCREASE OUTPUT" control on the "ARB" control box *(see figure 42)* should be at minimum (full counterclockwise).

(3) INTERPHONE TEST.—On the "MIXER" panel, set the "MIC SEL" microphone switch on "ICS"; press the press-to-talk switch on the microphone and call the radio operator. Release the press-to-talk switch while awaiting a reply. The "ICS" system should also be checked using the mask or lip microphone if such is provided. In this case, the throttle switch must be pressed in order to talk.

CAUTION

Both pilot and radio operator should take care that neither of their respective "MIC-SEL" switches is set accidentally on "VHF" or "HF" to avoid radio transmission.

(4) VHF RECEIVER TEST (AN/ARC-1).—For an actual operating test of this equipment, it is necessary that signals be present on the channels on which operation is contemplated. In the absence of signals, the squelch circuit reduces the receiver output to zero so that it is impractical to gauge receiver performance properly. The following instructions will illustrate the procedure even though signals are not present. On the "MIXER" panel, throw the left-hand toggle switch to "VHF." On the "VHF" panel throw the "GUARD-BOTH-MAIN T/R" switch to "GUARD." When this is done, "T/R" will appear in the upper window indicating that the equipment is set up for transmission and reception on the guard channel. "OFF" shows in the lower window, indicating that the main channel is disabled. If a signal is present, advance the "COMM VOLUME" control on "MASTER" panel to obtain the greatest headset volume that can be obtained without aural discomfort. A high setting of this "COMM VOLUME" control is desirable to keep the output from the other two receivers, especially the AN/ARC-5 receiver, at a satisfactory level. If a signal is not present, advance the "COMM VOLUME" control to maximum (full clockwise), and proceed with the remainder of the test. Throw the "GUARD-BOTH-MAIN T/R" switch to "MAIN T/R" and rotate the "CHAN SEL" switch until the assigned channel number appears in the lower window. "OFF" will appear in the upper window indicating that the guard channel is disabled. The equipment is now set up for transmission and reception on the main channel indicated. If a signal is available the "COMM VOLUME" control may be adjusted at this point. During normal operation, the "GUARD-BOTH-MAIN T/R" switch should be set on "BOTH." When the switch is so set, the guard channel output is combined with the main channel output selected by the "CHAN SEL" switch, thus enabling the pilot to monitor the guard and main channels simultaneously. In the event that signals appear simultaneously on both channels causing mutual interference in the headphones, the switch may be thrown to either "GUARD" or "MAIN T/R" depending on which channel the pilot desires to receive free from interference. With the switch in either the "BOTH" or "MAIN T/R" positions, transmission is possible on the main channel selected. When satisfied that the VHF receiving equipment is functioning satisfactorily, throw the left-hand toggle switch on the "MIXER" panel to "OUT." Do not disturb the "COMM VOLUME" control setting.

(5) For combat installation continue in accordance with procedure *(a)* below; for ferry installation continue in accordance with procedure *(b) below:*

(a) HF RECEIVER TEST (ARB)—COMBAT INSTALLATION.—On the "MIXER" panel, throw the middle toggle switch to "HF-1," and adjust the control (just above the toggle switch) marked "SET FOR MAX. TOLERABLE NOISE." IF THIS CONTROL IS NOT SET FOR THE MAXIMUM NOISE THAT CAN BE RECEIVED WITH COMFORT, WEAK SIGNALS MAY NOT BE HEARD. The "COMM VOLUME" control should be disturbed as little as possible from the setting found satisfactory when the VHF receiver was tested, consistent with obtaining adequate volume from the ARB receiver. Throw the middle toggle switch to "OUT," thus completing the adjustments and test of the ARB receiver. Next

set up AN/ARC-5 HF receiver (see subparagraph (6) below).

(b) ARB RECEIVER TEST—FERRY INSTALLATION.

1. Before proceeding with the operation of this equipment, it should be noted that certain combinations of the settings of the "HOMING—COMMUN" and "MVC-AVC" switches on the "ARB" control box cannot be obtained. This is a normal condition and no attempt should be made to force these switches into any positions to which they cannot be moved by normal pressure. It should be noted further that the two positions under "HOMING" on the "HOMING-COMMUN" switch are not used in this installation; no antenna is provided for these positions. Detailed instructions follow:

a. MCW AND VOICE RECEPTION.—Set the "HOMING-COMMUN" switch on one of the four bands under "COMMUN" on which reception is desired. If the band selected is either 195-560 kc. or 560-1600 kc., set the "MVC-AVC" switch on "MCW" and tune in the signal by means of the "ARB" tuning head. Perform this final tuning with the "INCREASE OUTPUT" control reduced to a low but comfortable volume level. If the band selected is either 1.5-4.5 mc or 4.5-9.05 mc, set the "MVC-AVC" switch in the "BROAD" position when searching for the signal. When the signal has been located, shift the "MVC-AVC" switch to "MCW" and perform the final tuning as described above. For voice reception, shift the "MVC-AVC" switch to "SHARP." Shifting from "MVC-AVC" operation, or vice versa, may require readjustment of the "INCREASE OUTPUT" control to maintain satisfactory volume level in the headphones.

b. RANGE RECEPTION.—The procedure is similar to that given above except that "MVC-AVC" switch must be set on "MCW" while receiving range signals. UNDER NO CIRCUMSTANCES SHOULD RANGE RECEPTION BE ATTEMPTED WITH THE "MVC-AVC" SWITCH ON ANY "AVC" POSITION. The "INCREASE OUTPUT" control should be set to the minimum value required for reception.

c. CW RECEPTION.—Set the "HOMING-COMMUN" switch to the desired band under "COMMUN." Set the "MVC-AVC" switch on "CW." Advance the "INCREASE OUTPUT" control until normal background noise is heard. Tune in the desired signal and readjust the "INCREASE OUTPUT" control for a comfortable volume level.

2. When satisfied that the receiver is performing satisfactorily, rotate the "INCREASE OUTPUT" control to minimum (full counterclockwise), thus completing adjustments and test of the "ARB" receiver.

(6) HF (YARDENY SPOT TUNED) RECEIVER TEST (AN/ARC-5).—On the "MIXER" panel, throw the right-hand toggle switch to "HF-2." Six preset channels are available on the "HF" panel for this receiver, which are controlled concurrently with the first six channels of the AN/ART-13 transmitter (see paragraph b. (10)). Select the desired channel. Adjust the control (just above the toggle switch) marked "SET FOR MAX. TOLERABLE NOISE." IF THIS SWITCH IS NOT SET FOR THE MAXIMUM NOISE THAT CAN BE RECEIVED WITH COMFORT, WEAK SIGNALS MAY NOT BE HEARD. The "COMM VOLUME" control on the "MASTER" panel should be disturbed as little as possible from the setting found satisfactory when the "VHF" receiver was tested, consistent with obtaining adequate volume from the AN/ARC-5 receiver. At the conclusion of the test throw the "HF-2" toggle switch to "OUT."

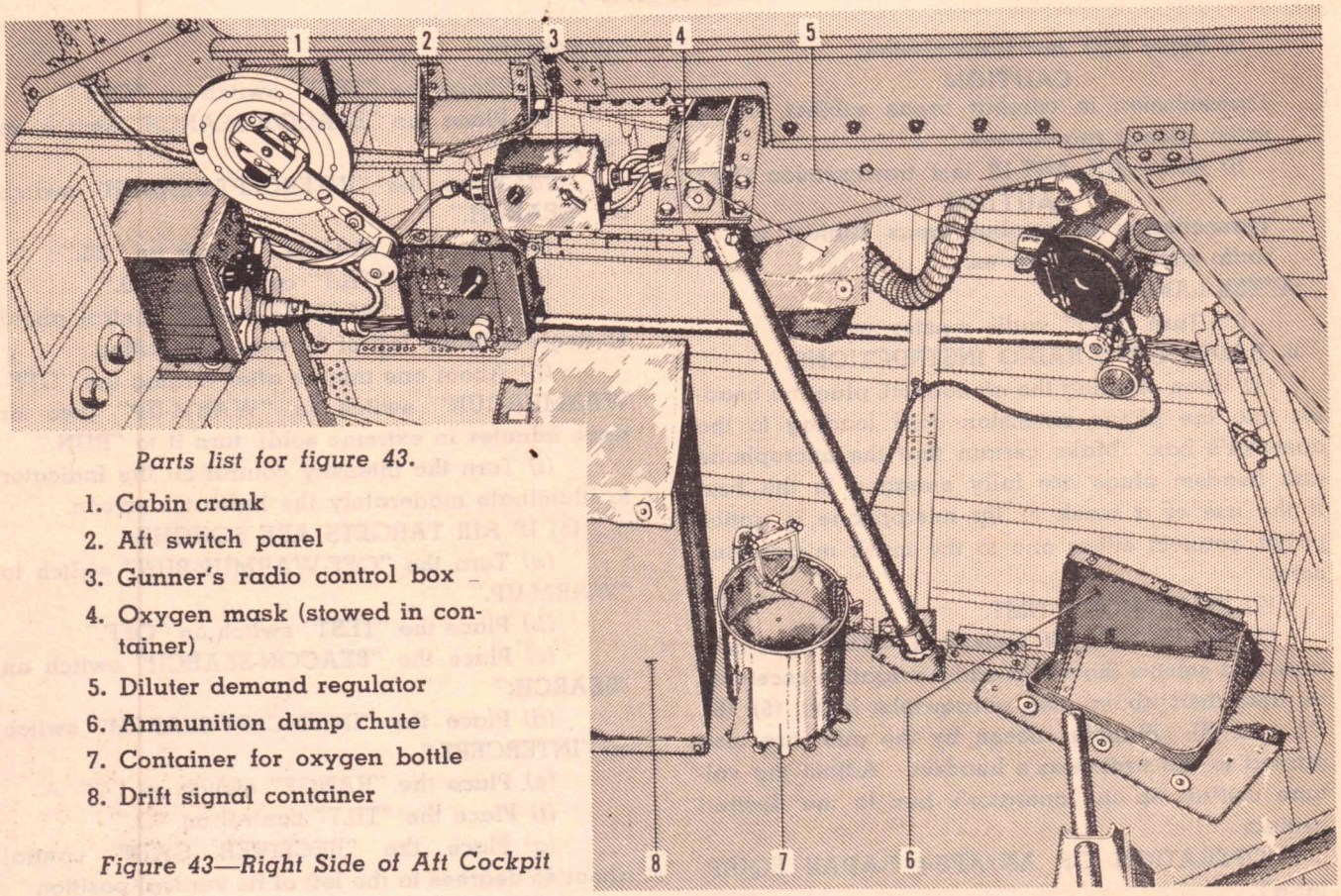
(7) For combat installation continue in accordance with procedure (a) below; for ferry installation continue in accordance with procedure (b) below:

(a) NAVIGATION RECEIVER TEST (AN/ARR-2A)—COMBAT INSTALLATION.—On the "NAVIG" panel, turn the "CHAN SEL" control to the desired channel. Set the "SENS" knob to obtain a usable weak signal, or if the desired signal cannot be heard, to a fairly strong background hiss. Do not disturb the "COMM VOLUME" control setting. If a signal is present, adjust the "PITCH" control to produce a pleasing audible tone. Readjust the "SENS" control to keep the signal rather weak. IF THE SIGNAL IS TOO STRONG, A CLEAR-CUT COURSE INDICATION CANNOT BE OBTAINED. The secret in accurate interpretation of navigation signals lies in the use of the *least* setting of the "SENS" control. Keep this control adjusted to receive only one character predominantly. The lower the signal level, the better the operation. When satisfied that the navigation receiver is operating properly, proceed as described in subparagraph (8) below. Do not disturb the above adjustments.

(b) FERRY INSTALLATION.—On the "NAVIG" panel, make certain that the "SENS" control is off (full counterclockwise), thus omitting the navigation receiver from the line-up.

(8) For combat installation continue in accordance with procedure (a) below; for ferry installation continue in accordance with procedure (b) below:

(a) SIMULTANEOUS OPERATION—COM-



Parts list for figure 43.

1. Cabin crank
2. Aft switch panel
3. Gunner's radio control box
4. Oxygen mask (stowed in container)
5. Diluter demand regulator
6. Ammunition dump chute
7. Container for oxygen bottle
8. Drift signal container

Figure 43—Right Side of Aft Cockpit

BAT INSTALLATION.—On the "MIXER" panel, throw the three toggle switches to "VHF," "HF-1," and "HF-2" respectively.

(b) SIMULTANEOUS OPERATION—FERRY INSTALLATION.—On the "MIXER" panel, throw the left hand and right hand toggle switches to "VHF" and "HF-2" respectively. "HF-1" middle toggle switch is *inoperative* for ferry installation. On the "ARB" Mixer panel, turn up the "INCREASE OUTPUT" control for normal operation (see paragraph (5) (*b*) above).

(9) VHF TRANSMISSION (AN/ARC-1).

WARNING

The instructions for operating transmitters are subject to local limitations regarding *radio silence.*

(a) Voice transmission only is provided by the "VHF" equipment. The receiving equipment should be in operation as described above. On the "VHF" panel, select the channel on which transmission is desired in accordance with the instructions in paragraph b. (4) above. On the "MIXER" panel, place the "MIC-SEL" microphone switch on "VHF." Press the press-to-talk switch on the hand-held microphone and proceed with the transmission. If a mask or a lip microphone is used in place of the hand-held microphone, press the throttle switch.

(10) HF TRANSMISSION (AN/ART-13 (ATC)).—The following instructions assume that the "LOCAL-REMOTE" switch located on the transmitter front panel has been placed in the "REMOTE" position. On the "HF" console panel, select the desired channel by means of the "CHANNEL" switch. The first six channels concurrently control the six channels of the AN/ARC-5 HF receiver. After about 25 seconds, the transmitter is set up on the channel selected. On the "MIXER" panel, place the "MIC SEL" switch on "HF," proceed with transmission. Press the press-to-talk switch on the hand-held microphone and talk. Release the switch to listen. If a lip or a mask microphone is used, press the throttle switch to talk.

(11) THE FOLLOWING CHECK-OFF LIST IS PROVIDED FOR THE PILOT: BEFORE TAKE-OFF:

(a) Plug in headset and mask or lip microphone if used.

(b) Turn "ON" master radio switch.

(c) Test ICS.

(d) Test VHF receiver.

(e) Test HF-1 receiver (ARB).

(f) Test HF-2 receiver (AN/ARC-5).

(g) Test navigation receiver (if combat installation).

(h) Set up for simultaneous operation.

(i) Make VHF test transmission.

CAUTION

Transmission in combat areas subject to *radio silence* regulations.

(j) Make AN/ART-13 test transmission (HF).

CAUTION

Transmission in combat areas subject to *radio silence* regulations.

AFTER LANDING:

(a) Turn "OFF" radio master switch.

c. RADIOMAN'S RADIO INSTRUCTIONS.

(1) Upon entering the aft cockpit, plug the headset into the phone extension cord leading to the operator's box. Make certain that the microphone and headset plugs are fully engaged in the box. If the use of a mask or lip microphone is anticipated, connect either one to the mask microphone cord.

(2) INTERPHONE TEST.

(3) RECEPTION IN GENERAL.—The pilot controls and selects the radio and navigation receivers as described above (see paragraphs b (4), (5), (6), (7), and (8). Signals chosen by the pilot are also passed to the radioman's headset. Adjust the volume control on the operator's box to the desired setting.

d. OPERATION OF AN/APS-4 RADAR EQUIPMENT.

(1) GENERAL. — Operators of the AN/APS-4 radar equipment must be thoroughly familiar with the equipment's controls on the control box, the indicator-amplifier and the indicator. A thorough review of the Equipment Operation Instruction Manual should be made at frequent intervals.

(2) SETTING CONTROLS FOR NON-OPERATIVE CONDITIONS.—Check the positions of the following switches on the control box to insure that the equipment is in an inoperative condition:

(a) TEST SWITCH.—"OFF".

(b) WARNING.—"OFF."

(c) BEACON SEARCH.—"SEARCH" or "BEACON."

(d) INTERCEPT-SEARCH—"SEARCH."

(e) RANGE.—"20."

(f) TILT.—"0."

(g) RECEIVER GAIN.—Full counterclockwise.

(h) OFF-WARMUP-RUN.—"Off."

(i) INTENSITY KNOB.—"Full counterclockwise (both indicators).

(3) TURNING THE EQUIPMENT ON.—Throw the "OFF-WARMUP-RUN" switch to the "WARM-UP" position. After waiting for at least one minute, (two or three minutes in extreme cold), throw the switch to the "RUN" position.

(4) IF SURFACE TARGETS ARE SOUGHT:

(a) Turn the "OFF-WARMUP-RUN" switch to "WARM-UP."

(b) Place the "TEST" switch on "OFF."

(c) Place the "BEACON-SEARCH" switch on "SEARCH."

(d) Place the "INTERCEPT-SEARCH" switch on "SEARCH."

(e) Place the "RANGE" switch on "20."

(f) Place the "TILT" control on "10."

(g) Turn the "RECEIVER-GAIN control about 45 degrees to the left of its vertical position.

(h) About one minute after turning the "OFF-WARMUP-RUN" switch to "WARM-UP" (two or three minutes in extreme sold), turn it to "RUN."

(i) Turn the intensity control on the indicator to illuminate moderately the indicator screen.

(5) IF AIR TARGETS ARE SOUGHT:

(a) Turn the "OFF-WARMUP-RUN" switch to "WARM-UP."

(b) Place the "TEST" switch on "OFF."

(c) Place the "BEACON-SEARCH" switch on "SEARCH."

(d) Place the "INTERCEPT-SEARCH" switch on "INTERCEPT."

(e) Place the "RANGE" switch on "4."

(f) Place the "TILT" control on "O."

(g) Place the "RECEIVER GAIN" control about 45 degrees to the left of its vertical position.

(h) One minute after turning the "OFF-WARMUP-RUN" switch to "WARM-UP" (two or three minutes in extreme cold), turn it to "RUN."

(i) Turn the intensity control on the indicator to illuminate moderately the indicator screen.

(j) Operate the "TILT" control for optimum results.

(6) IF BEACON HOMING IS DESIRED:

(a) Turn the "OFF-WARMUP-RUN" switch to "WARM-UP."

(b) Place the "TEST" switch on "OFF."

(c) Place the "BEACON-SEARCH" switch on "BEACON."

(d) Place the "INTERCEPT-SEARCH" switch on "SEARCH."

(f) Place the "TILT" control on "O".

(g) Place the "RECEIVER-GAIN" control 45 degrees to the left of vertical.

(h) One minute after turning the "OFF-WARMUP-RUN" switch to "WARM-UP" (two or three minutes in extreme cold), turn it to "RUN."

(i) Turn the density control on the indicator to illuminate moderately the indicator screen.

(7) TURNING OFF THE EQUIPMENT:

(a) Turn the "OFF-WARMUP-RUN" switch to "OFF."

(b) Turn the intensity controls on both indicators to the extreme counterclockwise positions.

(c) Turn the "RECEIVER GAIN" control to its

extreme counterclockwise position.

(8) ABNORMAL OPERATION.—Throw the "OFF-WARM-RUN" switch to the "OFF" position immediately if any abnormal operation is observed. Report any abnormal operation to the maintenance personnel as soon as possible.

e. OPERATION OF AN/APX-2 IFF EQUIPMENT.

(1) GENERAL.—Operators must be thoroughly familiar with the equipment controls. Hence for a complete and comprehensive description of all controls including present maintenance adjustments, the operator should be acquainted with the Equipment Operating Manual. The following is an abbreviated operating procedure:

(*a*) Before actual operation is begun, take the following precautions:

1. Check that a complete destructor-firing for the test has been performed in accordance with instructions of Equipment Operating Manuals.

2. On the pilot's control unit check that the guard latch marked "PUSH" effectively prevents the accidental rotation of the master control switch to its "EMERGENCY" position and that the red guard cover is closed down over the "DESTRUCT" switch.

(2) TO START THE EQUIPMENT.—Turn the master control switch S403 clockwise to any position beyond "OFF." Normally, S403 is rotated to the "NORM" position; further rotation clockwise is only done for designated tactical purposes. The ROO position is used only after certain readjustment has been made inside the receiver-transmitter unit by the maintenance crew. The "EMERGENCY" position is never used; except when the aircraft, during flight, is in extreme distress. The pilot will be governed by existing regulations dealing with the emergency operation.

(3) TO CHANGE SELECTOR SWITCH POSITIONS.—On the pilot's control unit rotate the selector switch S302 to the position designated by the commanding officer. Unless otherwise designated, selector switch is set and left in position "1".

(4) FOR INT OPERATION.—On the pilot's control unit throw the "INT" switch S401 to the "ON" position, or on the operator's control unit hold the "INT" switch S301 momentarily on the "PRESS" position.

(5) FOR G-BAND OPERATION.—On the pilot's control unit throw the "G-BAND" switch to the "ON" position or flip it to "TIME" position, in conformity with tactical considerations. This switch is normally left in the "OFF" position.

(6) FOR ROO OPERATION.—On the pilot's control unit, rotate the master switch S403 to the ROO position. (This is to be done only by specific direction of the commanding officer and only if a specifeed ROO adjustment has been made inside the receiver,transmitter unit by the maintenance crew.)

(7) FOR DISTRESS OPERATION.—On the pilot's control unit push the guard latch marked "PUSH" to the right, tilting it up, and rotate the master control switch to the "EMERGENCY" position.

(8) TO DESTROY THE RECEIVER-TRANSMITTER UNIT.—Warn operating personnel to stay clear of the receiver-transmitter unit. On the pilot's control unit raise the red guard cover and throw the "DESTRUCT" switch to the "ON" position.

(9) FURTHER OPERATING PROCEDURES.—Information on further operating procedures must be obtained from the commanding officer and the Equipment Maintenance Manual.

(10) TO STOP THE EQUIPMENT.—On the pilot's control unit rotate the master control switch to the extreme counterclockwise position marked "OFF."

f. OPERATION OF AN/APN-1 RADIO ALTIMETER EQUIPMENT.

(1) GENERAL.—A radio altitude meter is installed which indicates absolute altitude (terrain clearance) and provides altitude indication by means of a red light on the instrument panel *(see figure 4)* which lights when the airplane is below the pre-set altitude.

(2) OPERATION.

(*a*) Turn the "RANGE" knob counterclockwise until numerals "1," "2," and "4" appear on the face of the "RADIO ALTITUDE" instrument. To take readings at an altitude between 400 and 4000 feet, turn the "RANGE" knob full clockwise until the numerals "10," "20," "30," and "40" appear. In either event this reading will be in hundreds of feet. No indication above 4000 feet is afforded. With the "RANGE" knob in the counterclockwise position (low range) the meter should read less than five feet from "0," with the airplane in three-point attitude. Note that the high range ("RANGE" knob clockwise) is not calibrated for and MUST NOT BE USED at altitudes below 400 feet.

Note

Under conditions of poor visibility always use the low range when flying at altitudes below 600 feet.

(*b*) A continuous indication of true altitude is given by this meter and when flying over uneven terrain the indicating needle may fluctuate.

(*c*) To set the equipment in operation, turn clockwise the "ON" switch on the "RADIO ALTITUDE" meter. The green signal light marked

"HIGH" will appear immediately and will be sustained during the warm-up period. During this period of approximately one minute, the pointer of the "RADIO ALTITUDE" meter will move to some sub-zero reading and then back to its operation position, indicating that the equipment is functioning.

(d) If it is desired to operate at a constant altitude, particularly over water or flat, treeless terrain, the "ALTITUDE LIMIT SWITCH" *(see figure 42)* may be used in conjunction with the "RADIO ALT. IND." lights. The scale of the "ALTITUDE LIMIT SWITCH" is calibrated directly in feet for the low range; the same scale reads in "tens of feet" for the high range. The setting of the "ALTITUDE LIMIT SWITCH" may be changed at any time to a new pre-set altitude.

(e) Operation of the red light labeled "LOW" indicates flight below the control range corresponding to the pre-set altitude determined by the "ALTITUDE LIMIT SWITCH" setting.

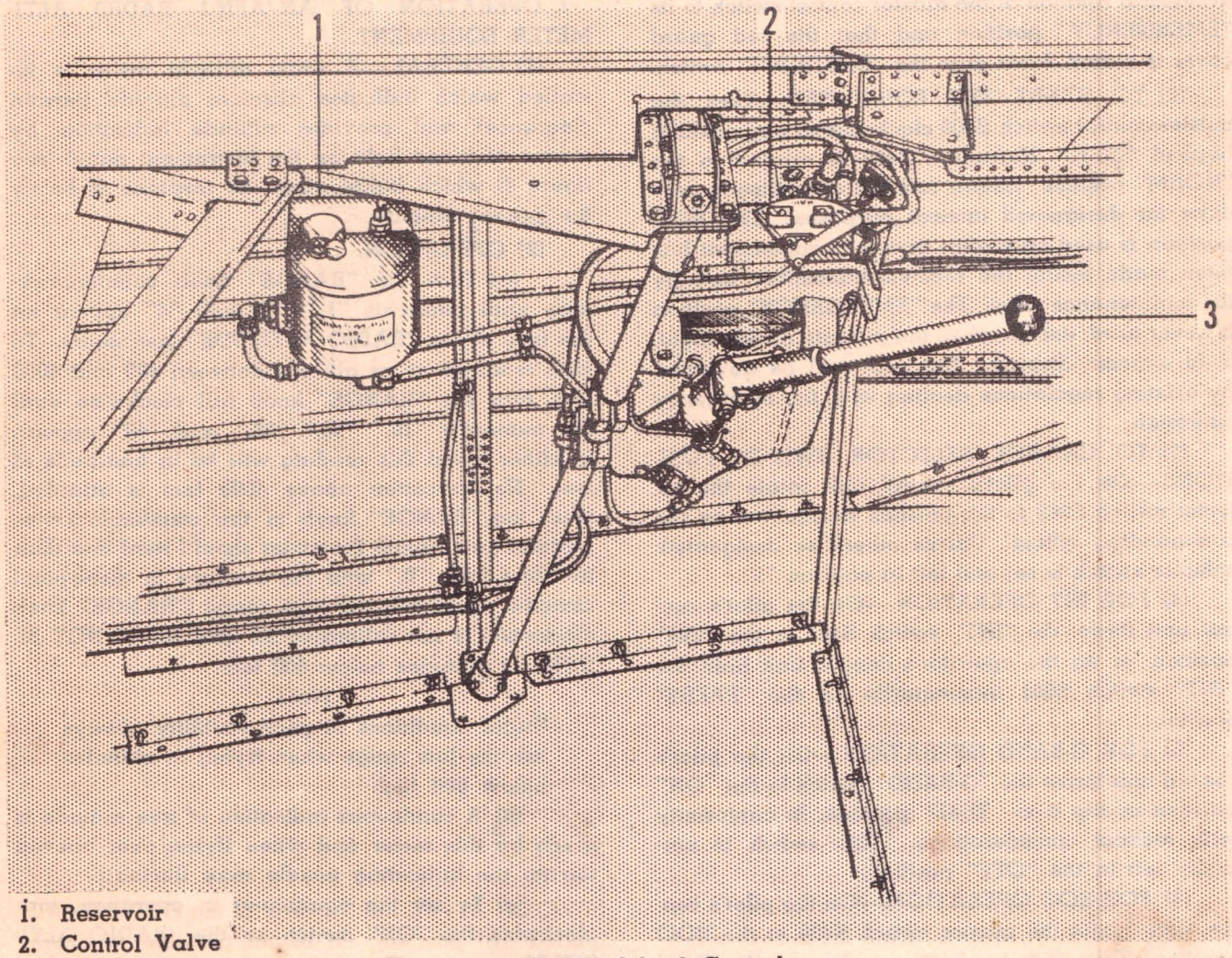
(f) Operation of the amber light labeled "SET ALT." indicates flight within the pre-set altitude control range.

(g) Operation of the green light indicates flight above the pre-set altitude control range.

(h) The control range varies with altitude. At 300 feet pre-set altitude, the green light should come on at a maximum of 320 feet and the red light at a minimum of 280 feet. At 3000 feet pre-set altitude, the green light should come on at a maximum of 3200 feet and the red light at a minimum of 2800 feet.

(i) At altitudes considerably above the upper limit of either range of the altimeter, the needle of the "RADIO ALTITUDE" meter will "kick-back" from full scale against the stop once or twice a second. On the low range this will occur at altitudes above approximately 1000 feet. On the high range this will occur at altitudes over 8000 feet.

(j) To stop the equipment, turn the power switch counterclockwise to the "OFF" position.

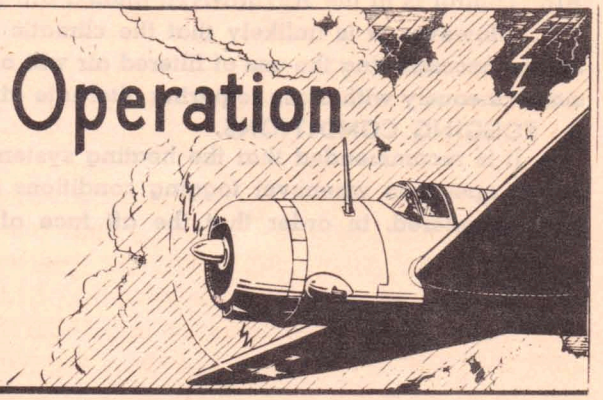


1. Reservoir
2. Control Valve
3. Hand pump

Figure 44--Turtleback Controls

Extreme Weather Operation

SECTION VI



1. COLD WEATHER OPERATION.

a. GROUND OPERATION.

(1) ENGINE STARTING.—The engine is started and warmed up in approximately the same manner at all times, regardless of weather conditions. However, in cold weather the engine is harder to start and requires more priming. Care must be taken not to flood the blower and lower cylinders with raw gasoline by priming excessively. If flooding does occur, turn the engine over several times by hand before attempting to start again.

(2) ENGINE WARM-UP.—A longer warm-up period is required in cold weather. Do not attempt to shorten the warm-up period by closing the cowl flaps, as this may cause the cylinder fins to crack and the insulation on the ignition system to burn.

(3) HYDRAULIC SYSTEM.—Operation of the hydraulic system in temperatures below —18°C. (0°F.) may result in injury to the system unless precautionary measures are taken. It is therefore recommended that operations in such temperatures be preceded by the following steps:

(*a*) Before starting engine, exhaust hydro oil from the main accumulator by opening the by-pass ("B") valve, which dumps the oil into the reservoir. Then close the valve and actuate the wing flaps and bomb bay doors by means of the hand pump, to force cold oil from the reservoir into circulation. The hydraulic system pressure gauge should read the same as the accumulator air pressure gauge (above 550 psi, the pre-load pressure of the accumulator).

(*b*) To exhaust the oil in the brake accumulator, open the by-pass ("B") valve. With the valve open, operate the brake pedals until the brake accumulator air pressuge gauge will drop no farther, indicating the pre-load pressure (350-450 psi). Close the number three valve and work the hand pump until the brake accumulator air gauge reads about 800 psi and coincides with the reading of the hydraulic system gauge. Operate the brakes a few times to circulate the oil.

b. FLIGHT OPERATION.

(1) CARBURETOR ICING.—When outside air temperature is near the freezing point of water and moisture content of the air is high, the carburetor has a tendency to ice up. This can be reduced by operating the engine with the carburetor air control in the alternate air position (pulled aft). The atmospheric conditions causing the carburetor to ice may be detected by the presence of sleet, snow, light rain, or cloudiness accompanied by near-freezing air temperature. The actual formation of ice in the carburetor is indicated by a slow dropping off of manifold pressure. The pilot should switch to alternate air as soon as he realizes conditions are favorable for icing, instead of waiting until there is a manifold pressure drop.

(2) OIL TEMPERATURE AND PRESSURE GAUGES.—Temperatures below 0°C. (32°F.) congeal oil in the oil pressure gauge line, and may cause the gauge to become sluggish when the engine is started, and the readings inaccurate until the oil is warm. If the gauges fail to read at all (either in cold or warm weather), stop the engine and investigate the cause of the trouble.

(3) HYDRAULIC OPERATION.

(*a*) The operation of any individual hydraulic unit may be sluggish if the actuating cylinder is located where it cannot benefit from cockpit or engine heat, as are the landing gear, bomb bay, and flap actuating struts. The operation of such units in flight should be started earlier than usual, and sufficient additional time allowed for completion of the operating cycle.

(*b*) Before landing, operate the brake pedals a few times to circulate the cold oil so that they will be easier to apply when needed.

2. DESERT CONDITIONS.

a. Under sandy conditions operate with the "CARBURETOR AIR FILTER" control in the FILTERED AIR (pulled aft) position. It is not possible to obtain filtered air when the "CARBURETOR ALTERNATE

AIR" control is in the ALTERNATE (pulled aft) position. However, it is unlikely that the climatic conditions necessitating the use of filtered air will occur simultaneously with those requiring alternate air.

3. FOGGING CONDITIONS.

a. It is recommended that the heating system be put in operation whenever fogging conditions may be encountered, in order that the aft face of the windshield and the forward face of the bullet resistant glass be kept warmer than outside air temperature. The heating unit should also be kept in operation and the cockpit ventilator and enclosure closed during dives. Use of the heating system, even though air temperatures are high, will result in maximum protection against loss of vision regardless of climatic conditions.

APPENDIX · I

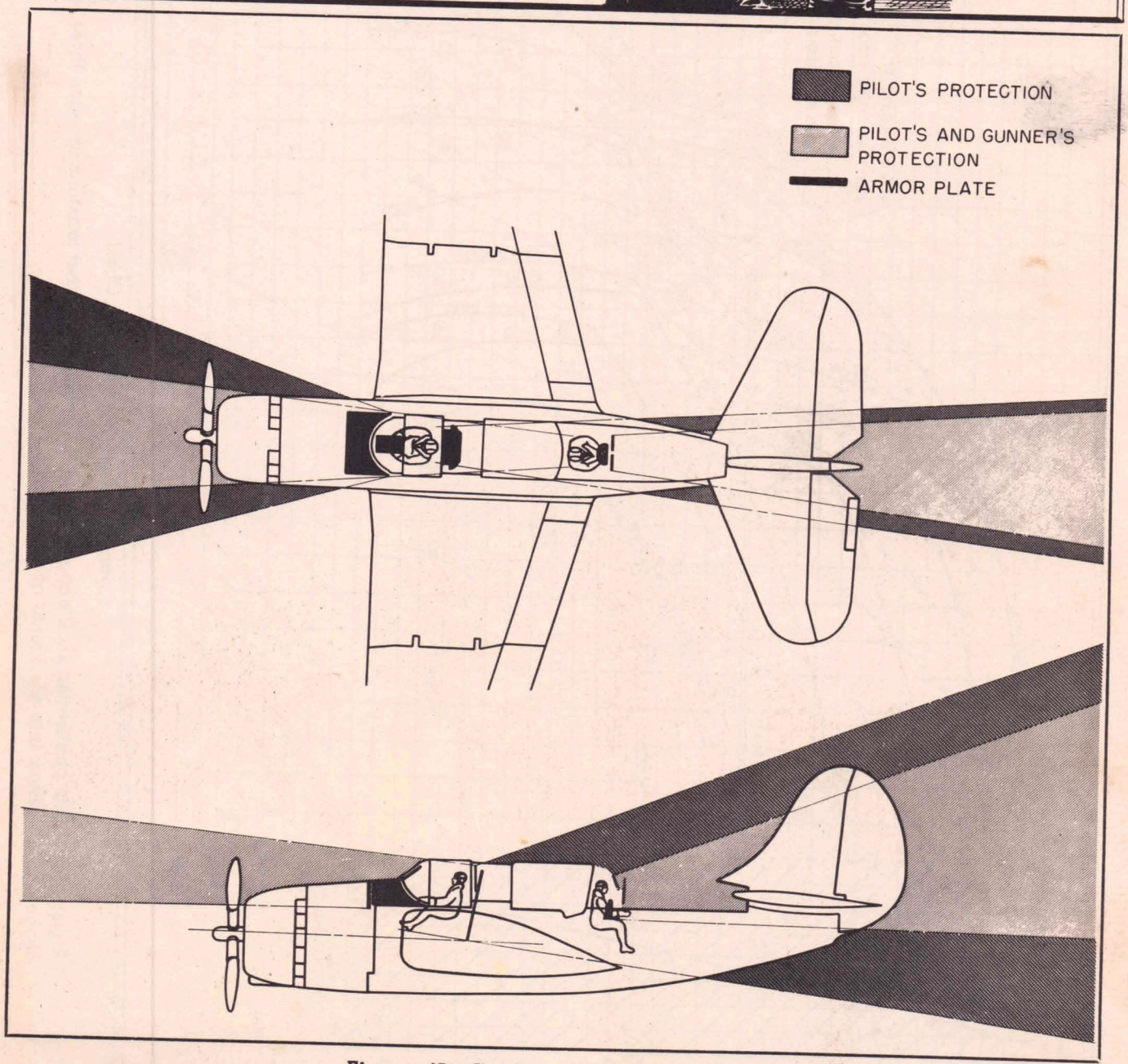


Figure 45—Gunfire Protection Diagram

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

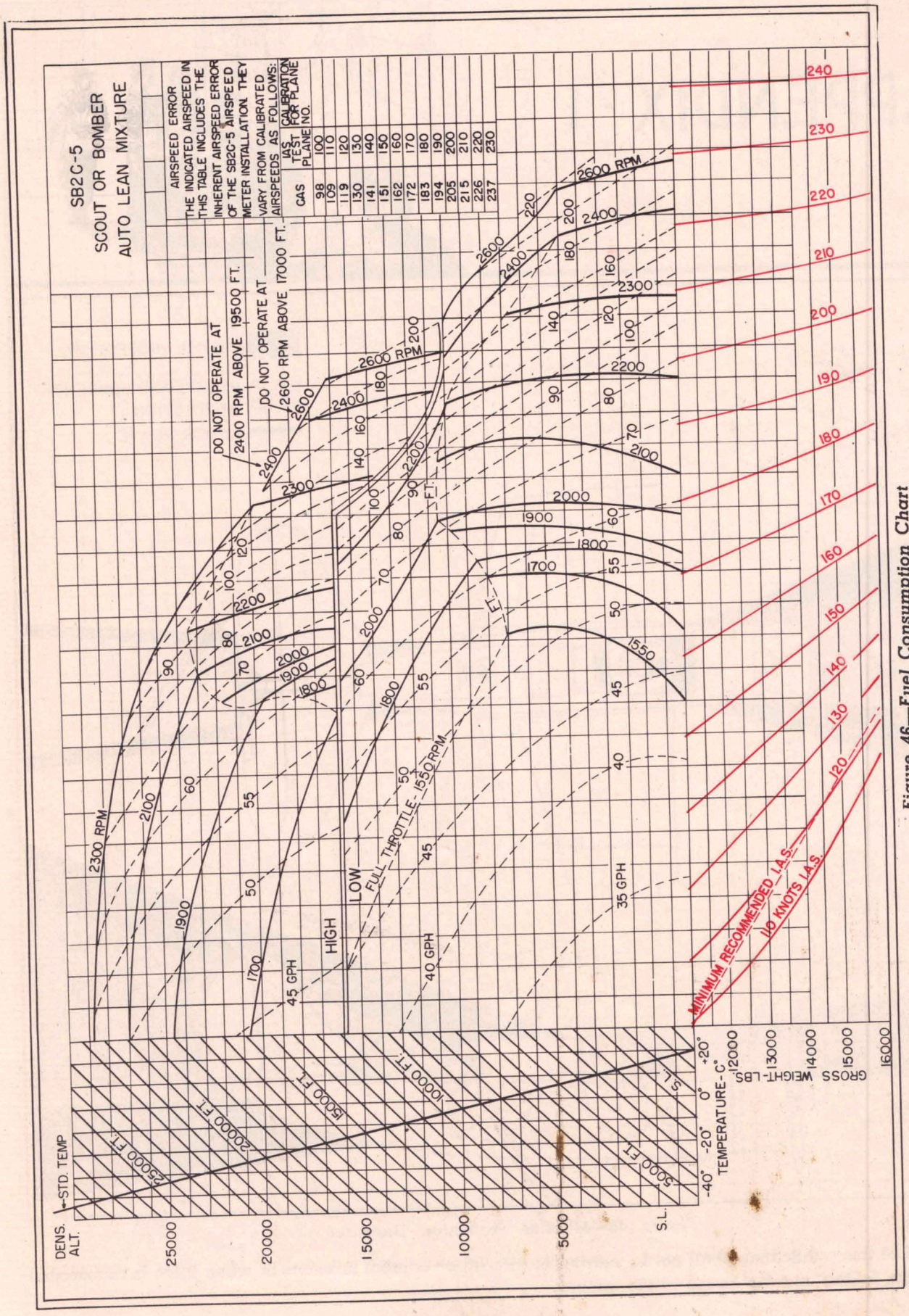


Figure 46—Fuel Consumption Chart

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

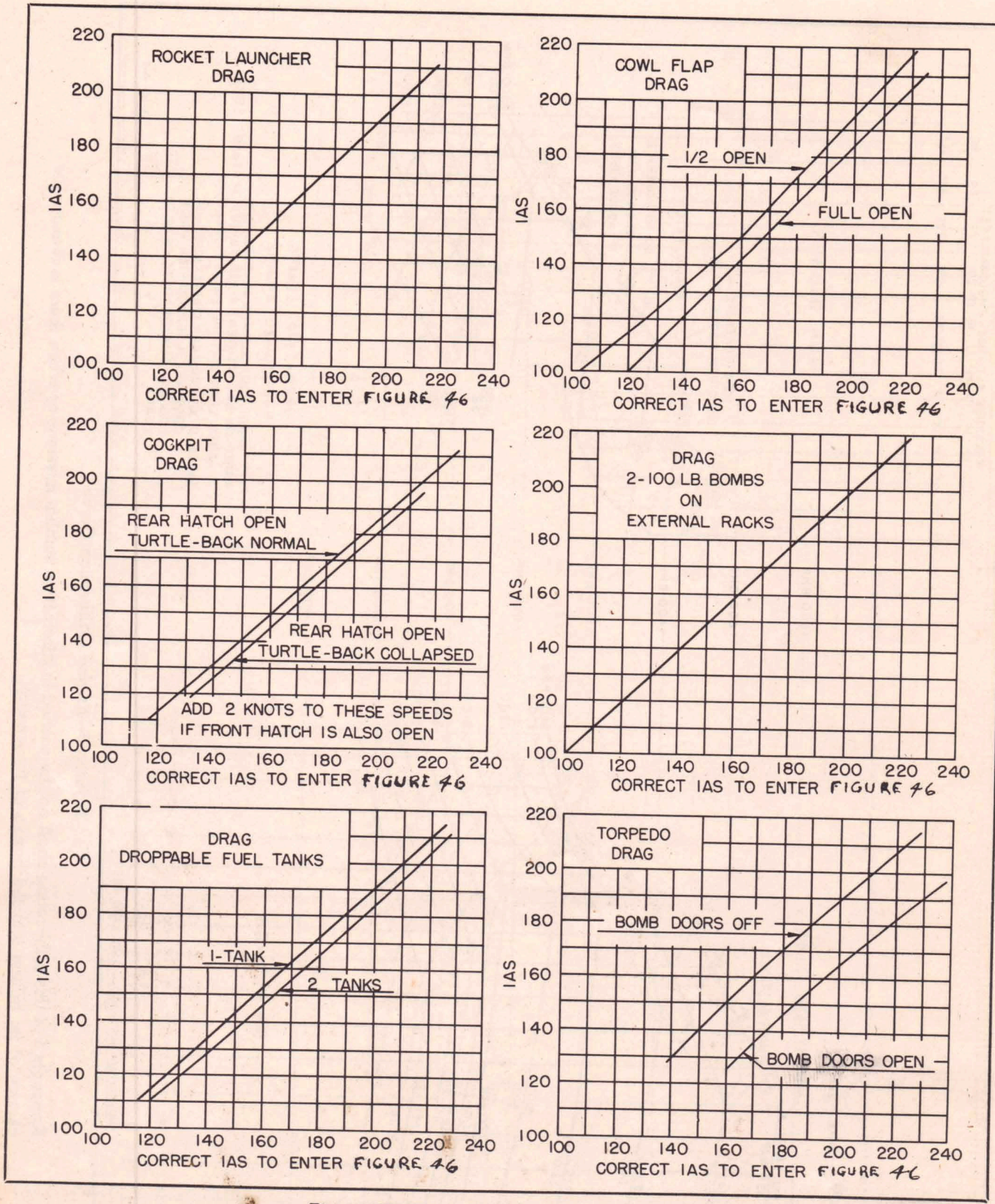


Figure 47—Drag Correction for Figure 46

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

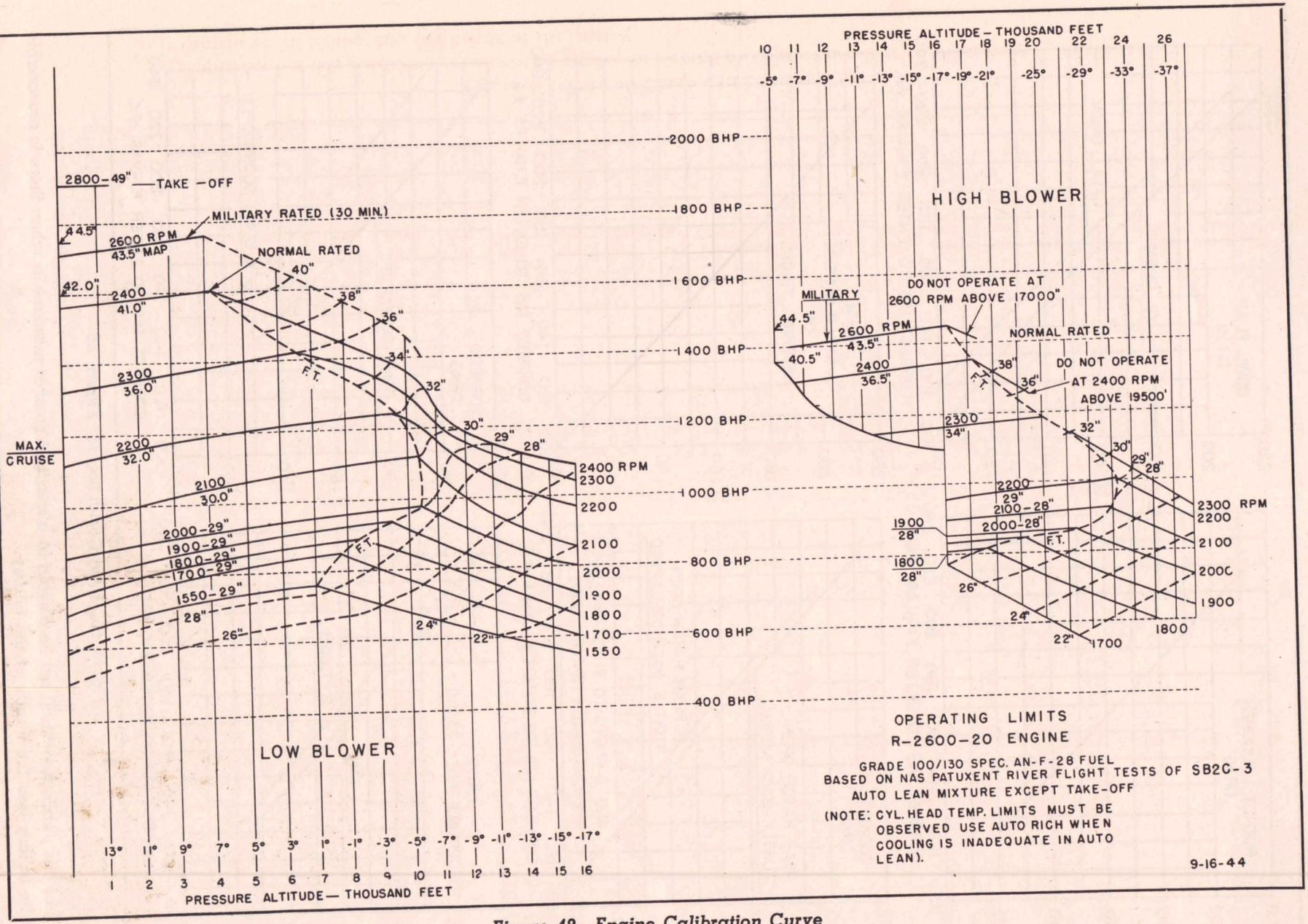


Figure 48—Engine Calibration Curve

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

AAFHC-527 4-1-44

AIRCRAFT MODEL(S)
SB2C-5

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S)
(1) R-2600-20

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.
12500	0	0	629	1088	742	1260	944	1596	640	1100	754	1272	964	1618	670	1130	802	1320	1017	1670
	17	15	384	732	464	862	605	1116	390	739	471	869	617	1129	409	757	501	900	650	1160
	34	30	194	435	245	524	416	787	196	437	249	527	425	796	206	447	265	544	447	819
14000	0	0	821	1410	985	1657	1352	2270	840	1422	1006	1677	1388	2310	884	1469	1066	1738	1480	2400
	17	15	514	967	635	1162	902	1577	526	980	647	1175	926	1600	554	1010	685	1215	987	1660
	34	30	274	595	356	740	646	1204	280	601	362	745	662	1221	295	616	385	768	707	1268
16000	0	0	1210	2040	1616	2690	2360	4000	1240	2075	1652	2730	2430	4090	1318	2150	1770	2845	2625	4260
	17	15	794	1459	1101	1972	1661	3020	816	1481	1129	1995	1711	3067	865	1530	1206	2075	1851	3205
	34	30	456	950	672	1340	1250	2320	469	964	687	1353	1288	2360	497	991	755	1405	1391	2465
18000	0	0	2000	3380	2488	4175	3675	6410	2055	3440	2570	4260	3800	6540	2210	3600	2790	4480	4200	6920
	17	15	1390	2525	1767	3190	2670	4970	1429	2560	1825	3250	2760	5060	1538	2670	1980	3405	3050	5350
	34	30	867	1755	1143	2253	2065	3930	890	1780	1181	2290	2140	4010	958	1845	1283	2390	2360	4230

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

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA

OPTIMUM TAKE-OFF WITH 2800 RPM, 49 IN.HG. & 45 DEG.FLAP IS 80% OF CHART VALUES

CLIMB DATA

GROSS WEIGHT LB.	AT SEA LEVEL BEST I.A.S. MPH	AT SEA LEVEL BEST I.A.S. KTS	AT SEA LEVEL RATE OF CLIMB F.P.M.	AT SEA LEVEL GAL. OF FUEL USED	AT 5000 FEET BEST I.A.S. MPH	AT 5000 FEET BEST I.A.S. KTS	AT 5000 FEET RATE OF CLIMB F.P.M.	AT 5000 FEET FROM SEA LEVEL TIME MIN.	AT 5000 FEET FROM SEA LEVEL FUEL USED	AT 10,000 FEET BEST I.A.S. MPH	AT 10,000 FEET BEST I.A.S. KTS	AT 10,000 FEET RATE OF CLIMB F.P.M.	AT 10,000 FEET FROM SEA LEVEL TIME MIN.	AT 10,000 FEET FROM SEA LEVEL FUEL USED	AT 15,000 FEET BEST I.A.S. MPH	AT 15,000 FEET BEST I.A.S. KTS	AT 15,000 FEET RATE OF CLIMB F.P.M.	AT 15,000 FEET FROM SEA LEVEL TIME MIN.	AT 15,000 FEET FROM SEA LEVEL FUEL USED	AT 20,000 FEET BEST I.A.S. MPH	AT 20,000 FEET BEST I.A.S. KTS	AT 20,000 FEET RATE OF CLIMB F.P.M.	AT 20,000 FEET FROM SEA LEVEL TIME MIN.	AT 20,000 FEET FROM SEA LEVEL FUEL USED	AT 25,000 FEET BEST I.A.S. MPH	AT 25,000 FEET BEST I.A.S. KTS	AT 25,000 FEET RATE OF CLIMB F.P.M.	AT 25,000 FEET FROM SEA LEVEL TIME MIN.	AT 25,000 FEET FROM SEA LEVEL FUEL USED
12500	138	120	1610	10	138	120	1515	3	21	138	120	1390	7	31	138	120	1235	10	42	138	120	862	15	54	138	120	508	22	74
14000	138	120	1174	10	138	120	1136	4	24	138	120	1021	9	37	138	120	840	14	52	138	120	571	21	70	138	120	346	32	100
16000	138	120	1091	10	138	120	909	5	27	138	120	769	11	43	138	120	625	18	62	138	120	486	27	87	—	—	—	—	—
18000	138	120	952	10	138	120	714	6	30	138	120	556	14	52	138	120	385	24	80	138	120	240	40	120	—	—	—	—	—

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

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA

CLIMB DATA BASED ON NAS PATUXENT FLIGHT TESTS OF SB2C-3 AIRPLANES

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

LANDING DISTANCE FEET

GROSS WEIGHT LB.	BEST IAS APPROACH POWER OFF MPH	POWER OFF KTS	POWER ON MPH	POWER ON KTS	HARD DRY SURFACE AT SEA LEVEL GROUND ROLL	AT SEA LEVEL TO CLEAR 50' OBJ.	AT 3000 FEET GROUND ROLL	AT 3000 FEET TO CLEAR 50' OBJ.	AT 6000 FEET GROUND ROLL	AT 6000 FEET TO CLEAR 50' OBJ.	FIRM DRY SOD AT SEA LEVEL GROUND ROLL	AT SEA LEVEL TO CLEAR 50' OBJ.	AT 3000 FEET GROUND ROLL	AT 3000 FEET TO CLEAR 50' OBJ.	AT 6000 FEET GROUND ROLL	AT 6000 FEET TO CLEAR 50' OBJ.	WET OR SLIPPERY AT SEA LEVEL GROUND ROLL	AT SEA LEVEL TO CLEAR 50' OBJ.	AT 3000 FEET GROUND ROLL	AT 3000 FEET TO CLEAR 50' OBJ.	AT 6000 FEET GROUND ROLL	AT 6000 FEET TO CLEAR 50' OBJ.
12500	98	85	92	80	1065	1831	1168	1962	1278	2103	1181	1949	1339	2132	1422	2250	2500	3262	2722	3520	2990	3820
16000	110	95	105	90	1362	2220	1490	2395	1632	2565	1509	2345	1649	2556	1802	2740	3200	4060	3485	4390	3820	4760

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA

45° FLAP DEFLECTION 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 49—Take-off Climb and Landing Chart

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

EXTERNAL LOAD ITEMS

Conditions:

(A) Clean Airplane

(B) This chart includes the addition of any ONE of the following configurations:

(1) ASH Radar Unit plus Torpedo with Bomb Doors off.

(2) ASH Radar Unit plus 8-5" Rockets.

(3) ASH Radar Unit plus (1) one External Droppable Wing Fuel Tank.

(4) (2) two External Droppable Wing Fuel Tanks.

(5) (2) two Wing Depth Charges.

(6) (2) two Wing Smoke Tanks.

(C) Torpedo with Bomb Doors Open plus (2) 58 gallon External Droppable Wing Fuel Tanks.

(D) Torpedo with Bomb Doors Open plus ASH Radar unit.

WP-3-31-44-10M AAFMC-528 4-1-44

AIRCRAFT MODEL(S) SB2C-5

ENGINE(S): (1) R-2600-20

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 15,500 **TO** 14,000 **POUNDS**

EXTERNAL LOAD ITEMS
CONDITION (A)
NUMBER OF ENGINES OPERATING: SINGLE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2600	43.5	LOW	A.L.*	30	248*	242

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

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

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

COLUMN I RANGE IN AIRMILES STAUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
—	—	355	—	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]			—		355	—	—
401	348	300	533	463	667	579	800	695	300	932	810
334	290	250	445	386	556	483	666	579	250	777	675
267	232	200	356	309	445	386	533	463	200	622	540
200	174	150	267	232	334	290	400	347	150	466	405
133	116	100	178	154	222	193	266	231	100	311	270
66	58	50	88	77	110	96	133	116	50	155	135
0	0	0	0	0	0	0	0	0	0	0	0

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(178 STAT. (1546 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(2225 STAT. (1931 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(2665 STAT. (2315 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
						25000																				25000						
2400	39.5	A.L.	206	275	239	20000	2300	34	A.L.	150	266	231	2250	31	A.L.	116	258	224	2200	29	A.L.	91	242	210									
						15000	2350	35	A.L.	146	260	226	2300	27*	A.L.	112	250	217	2200	25.8	A.L.	89	238	207		2000	24	A.L.	67	209	182
2400	33	A.L.	200	267	232	10000	2200	31.5	A.L.	143	254	221	2150	31	A.L.	110	245	213	2050	29.5	A.L.	88	235	204	10000	1900	28.5	A.L.	69	216	188
2400	40	A.L.	200	267	232	5000	2250	34	A.L.	139	247	215	2200	32	A.L.	107	238	207	2100	30	A.L.	85	228	198	5000	1950	29	A.L.	67	209	182
2400	41	A.L.	192	257	223	S.L.	2350	37	A.L.	136	243	211	2250	34	A.L.	105	234	203	2200	32	A.L.	83	222	193	S.L.	2000	29	A.L.	63	196	170

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 26) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

* OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS.

(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY

EXAMPLE

AT 15021 LB. GROSS WEIGHT WITH 272 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 83 GAL.) TO FLY 430 STAT. AIRMILES AT 20,000 FT. ALTITUDE MAINTAIN 2300 RPM AND 34 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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 3-1-45 BASED ON: PRELIMINARY DATA—{FUEL CONSUMPTION BASED ON NAS PATUXENT FLIGHT TESTS OF SB2C-3 AIRPLANES.} RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure 50—Flight Operation Instruction Chart *(Plate 1 of 6)*

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

AAFMC-528 4-1-44 W.P.-31-44-10M

AIRCRAFT MODEL(S): SB2C-5

ENGINE(S): (1) R-2600-20

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 14000 TO 12500 POUNDS

EXTERNAL LOAD ITEMS
CONDITION (A)

NUMBER OF ENGINES OPERATING: SINGLE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2600	43.5	LOW	A.L. *	30	248°	242

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

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

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

COLUMN I RANGE IN AIRMILES STAUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING(1)								
—	—	355	—	—			—		355	—	—
405	352	300	552	480	697	606	846	735	300	995	864
338	294	250	460	400	581	505	705	613	250	829	720
270	235	200	368	320	465	404	564	490	200	663	576
202	176	150	276	240	349	303	422	367	150	497	432
135	117	100	184	160	232	202	282	245	100	332	288
66	58	50	92	80	116	101	140	122	50	166	144
0	0	0	0	0	0	0	0	0	0	0	0

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(1840 STAT. (1.60 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(2.325 STAT. (2.02 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(2.82 STAT. (2.45 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
						25000													2200	27	A.L.	90	253	220	25000						
						20000													2200	29	A.L.	89	252	219	20000						
2400	39.5	A.L.	206	278	242	15000	2300	34	A.L.	149	274	238	2250	31	A.L.	114	266	231	2200	25.8	A.L.	86	242	210	15000	1900	23	A.L.	63	209	180
							2350	35	A.L.	144	266	231	2300	26.5	A.L.	110	256	222													
2400	33	A.L.	199	269	234	10000	2200	31.5	A.L.	140	259	225	2150	30.5	A.L.	107	250	217	2050	29.5	A.L.	84	236	205	10000	1850	28	A.L.	66	219	190
2400	40	A.L.	199	269	234	5000	2250	34	A.L.	136	250	217	2200	32	A.L.	104	242	210	2100	30	A.L.	81	230	200	5000	1750	29	A.L.	62	205	178
2400	41	A.L.	191	258	224	S.L.	2300	36	A.L.	133	244	212	2250	34	A.L.	101	235	204	2150	31	A.L.	79	222	193	S.L.	1750	29	A.L.	57	189	164

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 26) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

* OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS.

(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 13829 LB. GROSS WEIGHT WITH 240 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 60 GAL.) TO FLY 250 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2400 RPM AND 39.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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

(FUEL CONSUMPTION BASED ON NAS PATUXENT

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA FLIGHT TESTS OF SB2C-3 AIRPLANES.) RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure 51—Flight Operation Instruction Chart *(Plate 2 of 6)*

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

AAFHC-528 8-1-44 WP-8-31-44-10M

AIRCRAFT MODEL(S) SB2C-5

ENGINE(S): (1) R-2600-20

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 16800 TO 15000 POUNDS

EXTERNAL LOAD ITEMS CONDITION (B)

NUMBER OF ENGINES OPERATING: SINGLE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2600	43.5	LOW	A.L. *	30	248°	242

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

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

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

COLUMN I RANGE IN AIRMILES STAUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
—	—	655	—	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]					655	—	—
739	642	600	900	783	1060	924	1220	1061	600	1390	1205
678	589	550	825	717	975	847	1120	973	550	1270	1105
616	535	500	751	653	886	770	1020	885	500	1150	1005
555	482	450	675	587	797	693	916	796	450	1040	905
493	428	400	601	522	709	616	815	708	400	925	804
432	375	350	525	456	620	539	712	619	350	809	703
370	321	300	450	391	532	462	611	531	300	694	603
307	267	250	375	326	443	385	509	442	250	577	502
246	214	200	300	260	354	308	407	354	200	462	402
185	160	150	225	195	266	231	305	265	150	348	302
123	107	100	150	130	177	154	204	177	100	231	201
61	53	50	75	65	88	77	102	88	50	115	100
0	0	0	0	0	0	0	0	0	0	0	0

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(1.50 STAT. (1.30 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(1.73 STAT. (1.54 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(2.04 STAT. (1.77 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
						25000																				25000						
						20000							2300	32	A.L.	130	230	200	2250	31	A.L.	109	222	193		20000						
2400	39.5	A.L.	200	246	214	15000	2350	37	A.L.	156	235	204	2300	34	A.L.	127	225	196	2300	27	A.L.	107	217	189		15000	2200	25.8	A.L.	90	209	182
2400	33	A.L.	194	239	208	10000	2250	32	A.L.	155	234	203	2200	31.5	A.L.	128	227	197	2150	30.5	A.L.	108	220	191		10000	2050	29.5	A.L.	91	209	182
2400	40	A.L.	201	247	215	5000	2300	36	A.L.	152	229	199	2250	34	A.L.	125	222	193	2200	32	A.L.	105	215	187		5000	2150	31	A.L.	89	208	181
2400	41	A.L.	193	238	207	S.L.	2350	39	A.L.	149	224	195	2300	36	A.L.	123	219	190	2250	34	A.L.	103	211	183		S.L.	2200	32	A.L.	88	205	178

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 26) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

* OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS.

(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 16380 LB. GROSS WEIGHT WITH 285 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 70 GAL.) TO FLY 400 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2300 RPM AND 34 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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 3-1-45 BASED ON: PRELIMINARY DATA (FUEL CONSUMPTION BASED ON NAS PATUXENT FLIGHT TESTS OF SB2C-3 AIRPLANES.) RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure 52—Flight Operation Instruction Chart *(Plate 3 of 6)*

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

AAFMC-528 4-1-44 WP-2-31-44-10M

AIRCRAFT MODEL(S) SB2C-5

ENGINE(S): (1) R-2600-20

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 15000 TO 13500 POUNDS

EXTERNAL LOAD ITEMS CONDITION (B)

NUMBER OF ENGINES OPERATING: SINGLE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2600	43.5	LOW	A.L.*	30	248*	242

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

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

NOTES: COLUMN I IS FOR EMERGENCY HIGH SPEED CRUISING ONLY. COLUMNS II, III, IV AND V GIVE PROGRESSIVE INCREASE IN RANGE AT A SACRIFICE IN SPEED. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[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					
STAUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL				STATUTE		NAUTICAL				STATUTE		NAUTICAL				GAL.	STATUTE		NAUTICAL			
						655	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]																		655						
						600	984		855				1215		1055				1444		1254				600	1680		1460			
752		654				550	902		784				1115		968				1323		1150				550	1540		1338			
						500	820		712				1012		880				1202		1045				500	1400		1215			
627		545				450	738		641				910		791				1081		940				450	1260		1093			
564		490				400	656		570				810		704				962		836				400	1120		973			
501		436				350	573		498				709		616				841		731				350	978		850			
438		381				300	491		427				608		528				721		627				300	840		730			
376		327				250	410		356				506		440				601		522				250	700		608			
313		272				200	328		285				405		352				481		418				200	559		486			
251		218				150	246		214				304		264				361		314				150	420		365			
187		163				100	164		142				203		176				241		209				100	280		243			
125		109				50	82		71				101		88				120		104				50	140		121			
62		54				0	0		0				0		0				0		0				0	0		0			

MAXIMUM CONTINUOUS						PRESS	(1.64 STAT. (1.425 NAUT.) MI./GAL.)						(2.03 STAT. (1.76 NAUT.) MI./GAL.)						(2.41 STAT. (2.09 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000	2300	33	A.L.	150	246	214	2250	31	A.L.	117	237	206	2250	30	A.L.	96	231	201	20000						
2400	39.5	A.L.	202	254	221	15000	2350	36	A.L.	146	239	208	2300	27	A.L.	114	231	201	2200	25.8	A.L.	92	223	194	15000	2100	25	A.L.	75	209	182
2400	33	A.L.	196	246	214	10000	2200	31.5	A.L.	144	237	206	2150	31	A.L.	112	227	197	2050	29.5	A.L.	91	220	191	10000	1950	29	A.L.	74	207	180
2400	40	A.L.	199	250	217	5000	2250	34	A.L.	141	231	201	2200	32	A.L.	110	223	194	2150	30.5	A.L.	88	213	185	5000	2000	29	A.L.	70	197	171
2400	41	A.L.	191	239	208	S.L.	2350	38	A.L.	137	224	195	2250	34	A.L.	107	217	189	2200	32	A.L.	86	207	180	S.L.	2050	29.5	A.L.	67	189	164

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 26) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

* OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS.

(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 15000 LB. GROSS WEIGHT WITH 395 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 60 GAL.) TO FLY 700 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2300 RPM AND 27 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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

(FUEL CONSUMPTION BASED ON NAS PATUXENT FLIGHT TESTS OF SB2C-3 AIRPLANES)

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure 53—Flight Operation Instruction Chart *(Plate 4 of 6)*

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

AAFMC-528 4-1-44 W.P. 3-31-44-10M

AIRCRAFT MODEL(S)
SB2C-5

ENGINE(S): (1) R-2600-20

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 17500 TO 16800 POUNDS

EXTERNAL LOAD ITEMS
CONDITION (C)

NUMBER OF ENGINES OPERATING:

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2600	43.5	LOW	A.L.*	30	248*	242

FOR DETAILS SEE POWER PLANT CHART (FIG. 111)

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 RANGE IN AIRMILES		FUEL U.S.	COLUMN II RANGE IN AIRMILES		COLUMN III RANGE IN AIRMILES		COLUMN IV RANGE IN AIRMILES		FUEL U.S.	COLUMN V RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
—	—	471	—	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]					471	—	—
403	350	400	496	431					400	590	513
352	306	350	434	377					350	516	449
303	263	300	372	323					300	443	385
252	219	250	310	269					250	369	321
201	175	200	248	215					200	295	256
151	131	150	185	161					150	221	192
100	87	100	124	107					100	147	128
49	43	50	61	53					50	73	64
0	0	0	0	0					0	0	0

MAXIMUM CONTINUOUS						PRESS	(1.24 STAT. (1.078 NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						(STAT. (NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	39.5	A.L.	194	196	170	15000	2350	36	A.L.	146	182	158													15000						
2400	33	A.L.	192	193	168	10000	2200	31.5	A.L.	145	181	157													10000	2150	31	A.L.	118	174	151
2400	40	A.L.	199	200	174	5000	2300	35	A.L.	148	184	160													5000	2250	33	A.L.	119	176	153
2400	41	A.L.	194	196	170	S.L.	2350	38	A.L.	148	184	160													S.L.	2300	35	A.L.	118	174	151

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 26) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
*OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 17320 LB. GROSS WEIGHT WITH 441 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 30 GAL.) TO FLY 400 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2400 RPM AND 40 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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

(FUEL CONSUMPTION BASED ON NAS PATUXENT FLIGHT TESTS OF SB2C-3 AIRPLANES)

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA

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

Figure 54—Flight Operation Instruction Chart *(Plate 5 of 6)*

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

AAFMC-528 4-1-44

AIRCRAFT MODEL(S): SB2C-5

ENGINE(S): (1) R-2600-20

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 16800 TO 15000 POUNDS

EXTERNAL LOAD ITEMS
CONDITION (D)

NUMBER OF ENGINES OPERATING: SINGLE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2600	43.5	LOW	A.L.*	30	248*	242

FOR DETAILS SEE POWER PLANT CHART 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 RANGE IN AIRMILES STAUTE	COLUMN I RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
—	—	355	—	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]					355	—	—
328	285	300	413	359					300	500	435
274	238	250	344	299					250	417	362
219	190	200	275	239					200	334	290
163	142	150	206	179					150	250	217
109	95	100	137	119					100	167	145
54	47	50	68	59					50	83	72
0	0	0	0	0					0	0	0

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(1.376 STAT. (1.196 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S.		(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S.		PRESS ALT FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
2400	39.5	A.L.	197	215	187	25000 20000 15000	2350	36	A.L.	146	201	175													25000 20000 15000						
2400	33	A.L.	194	212	184	10000	2200	31.5	A.L.	146	201	175													10000	2150	31	A.L.	116	193	168
2400	40	A.L.	199	217	189	5000	2250	34	A.L.	145	200	174													5000	2250	33	A.L.	115	192	167
2400	41	A.L.	190	208	181	S.L.	2350	38	A.L.	144	198	172													S.L.	2300	35	A.L.	115	192	167

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 26) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
* OPERATION IN AUTO-LEAN IS CONTINGENT UPON MAINTAINING TEMPERATURE BELOW LIMITS.
(2) USE HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 16500 LB. GROSS WEIGHT WITH 305 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 50 GAL.) TO FLY 400 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 2200 RPM AND 31.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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

(FUEL CONSUMPTION BASED ON NAS

DATA AS OF 3-1-45 BASED ON: PRELIMINARY DATA PATUXENT FLIGHT TESTS OF SB2C-3 AIRPLANES RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

Figure 55—Flight Operation Instruction Chart *(Plate 6 of 6)*

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

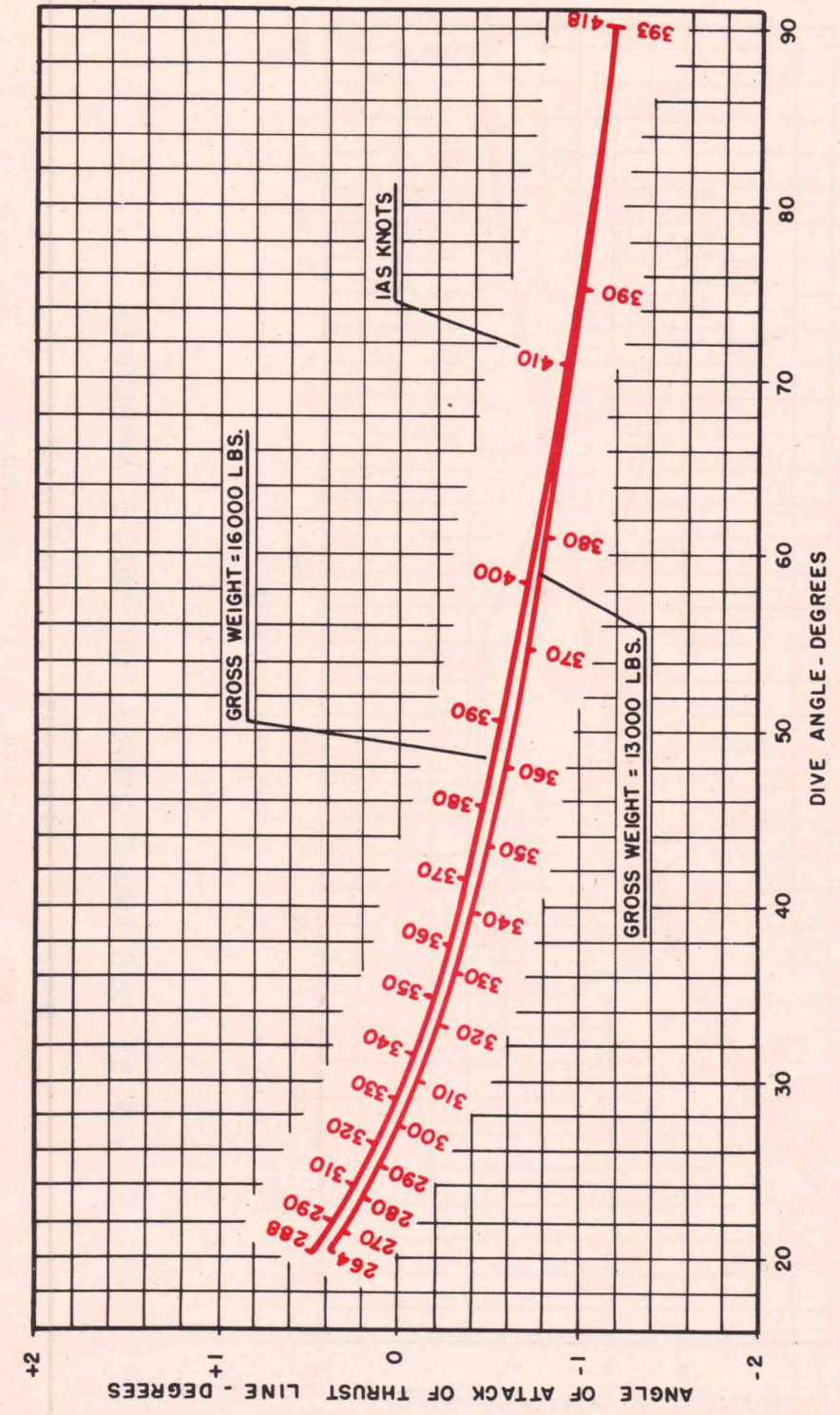


FIG. 56 DIVE ANGLE CURVES FOR SB2C-5 AIRPLANES

SHEET 1 OF 5

POWER	BOMB DOORS	DIVE FLAPS
OFF	CLOSED	CLOSED

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

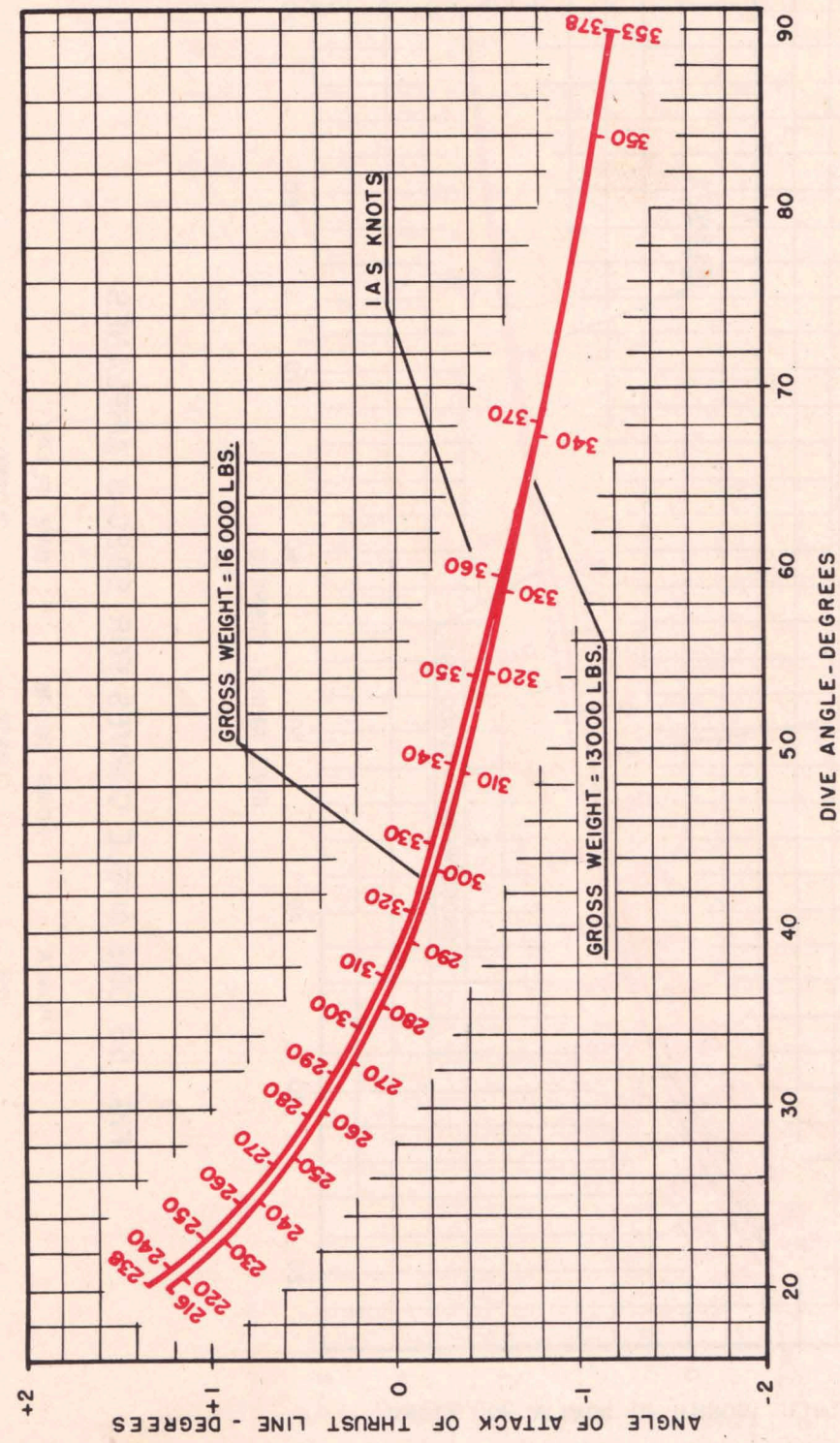


FIG. 57 DIVE ANGLE CURVES FOR SB2C-5 AIRPLANES

POWER — OFF
BOMB DOORS — OPEN
DIVE FLAPS — CLOSED

SHEET 2 OF 5

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

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

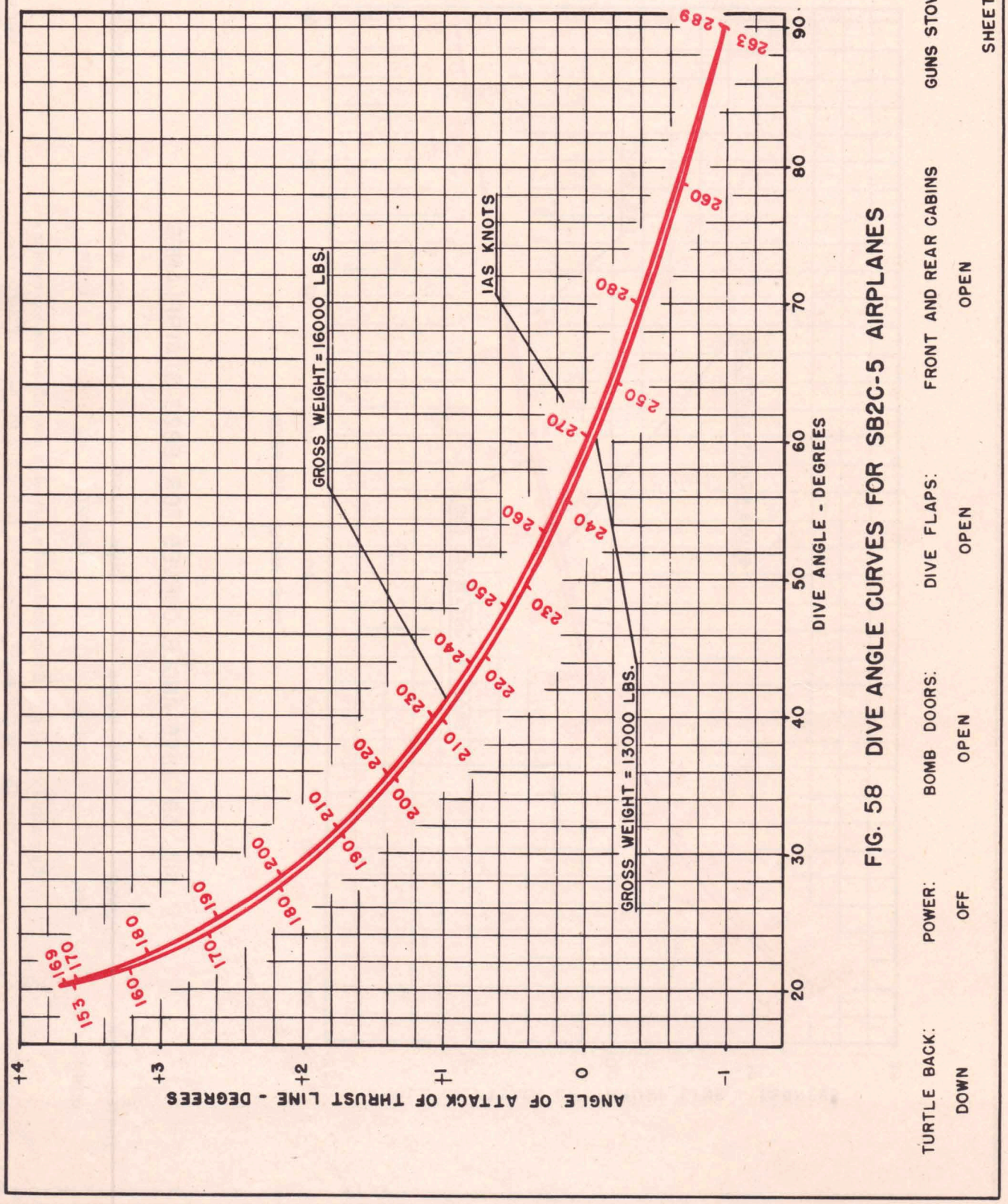


FIG. 58 DIVE ANGLE CURVES FOR SB2C-5 AIRPLANES

TURTLE BACK: DOWN
POWER: OFF
BOMB DOORS: OPEN
DIVE FLAPS: OPEN
FRONT AND REAR CABINS OPEN
GUNS STOWED

SHEET 3 OF 5

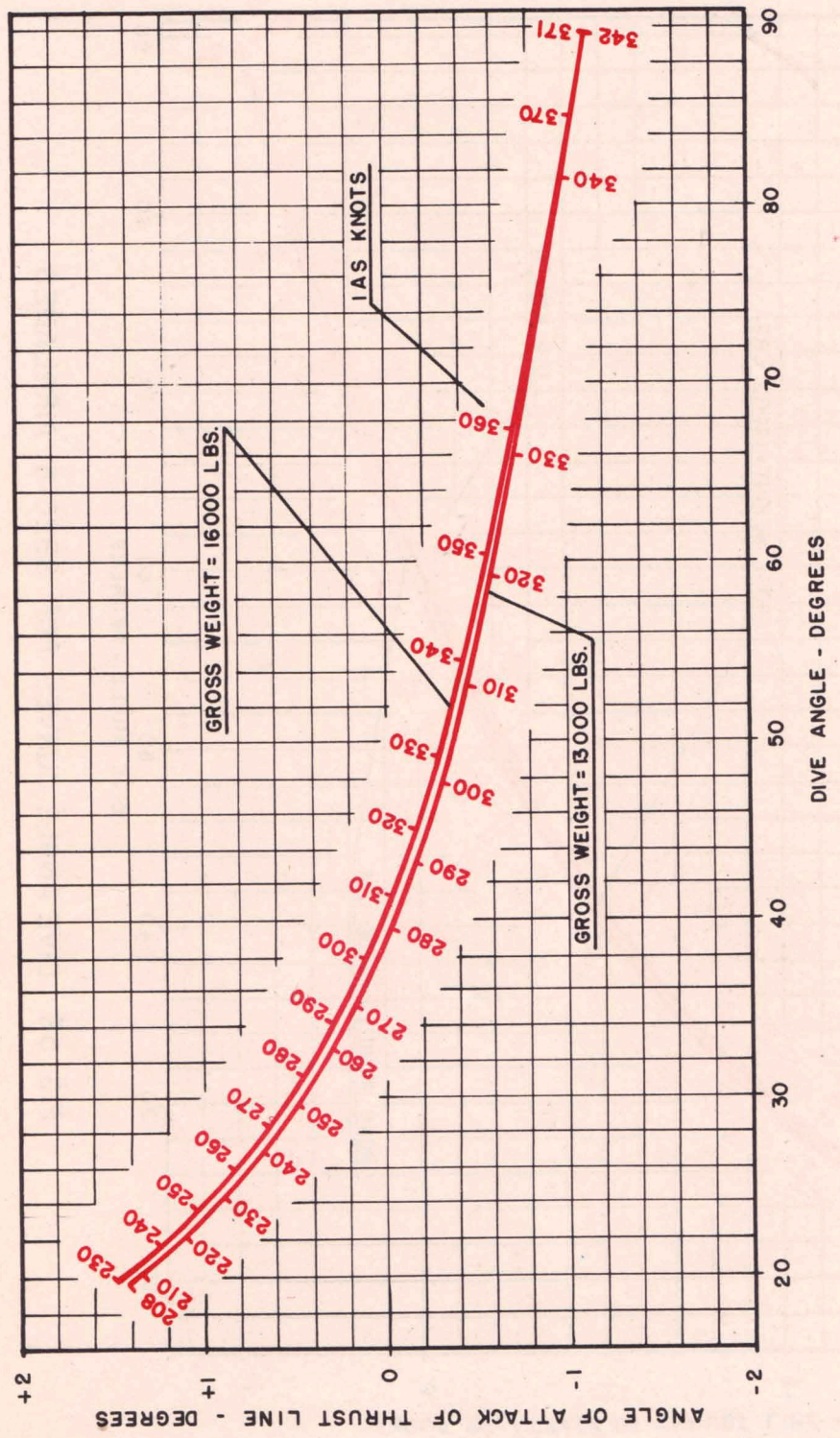


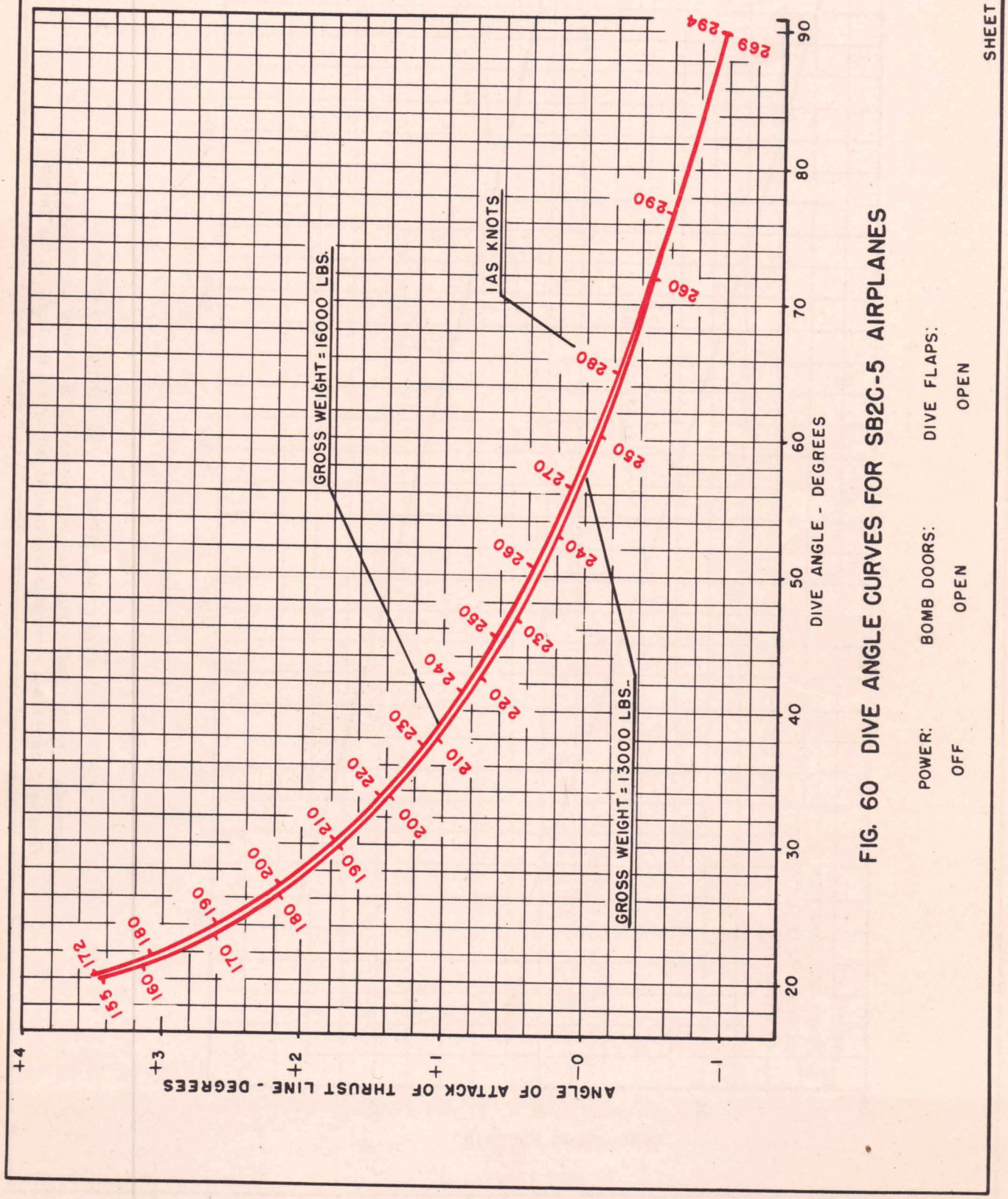
FIG. 59 DIVE ANGLE CURVES FOR SB2C-5 AIRPLANES

TURTLE BACK	POWER	BOMB DOORS	DIVE FLAPS	FRONT AND REAR CABINS	GUNS STOWED
DOWN	OFF	OPEN	CLOSED	OPEN	

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

SHEET 4 OF 5

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



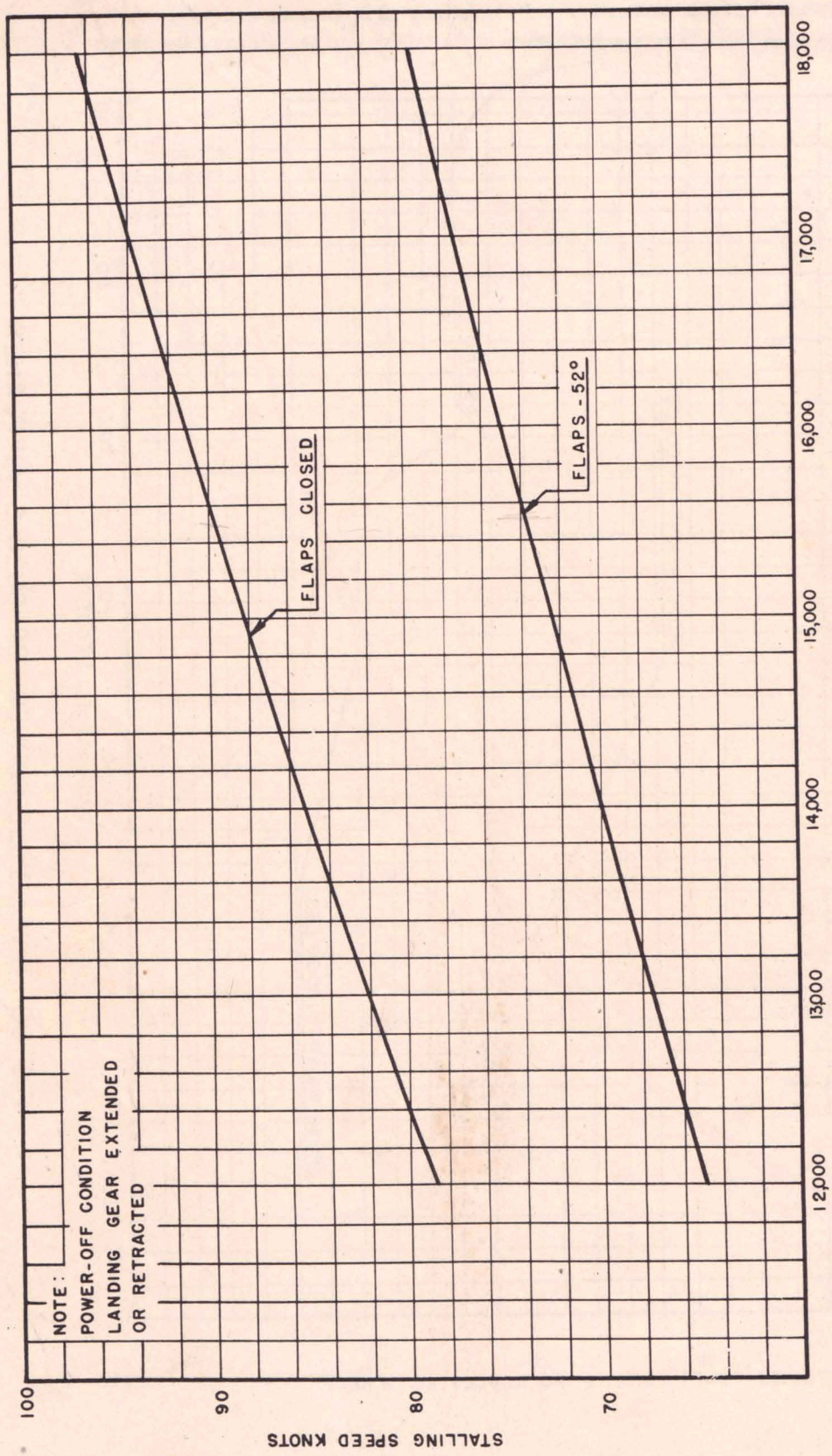


FIG. 61 STALLING SPEED VS. GROSS WEIGHT

Appendix 1 of this Publication shall not be carried in Aircraft on Combat Missions or when there is reasonable chance of it falling into the hands of the Enemy.