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*PILOT'S FLIGHT OPERATING
INSTRUCTIONS*

FOR

**ARMY MODELS
PT-19, -19A, -19B
-23 and -26**

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TABLE OF CONTENTS

Section	Page	Section	Page
I Introduction	1	14. Stopping Engine	17
II Description	1	15. Before Leaving the Cockpit	17
1. Airplanes	1	16. Maneuvers Prohibited	17
2. Power Plants	2	IV Flight Operation Data	17
3. Controls and Operational Equipment	4	1. Determining Gross Weight	17
4. Flying Characteristics	14	2. Flight Planning	17
III Flight Operating Instructions PT-19, PT-19A, PT-19B, and PT-26	15	Weight and Balance Chart PT-19	19
1. On Entering the Cockpit	15	Weight and Balance Chart PT-19A	20
2. Starting Engine	15	Weight and Balance Chart PT-19B	21
3. Engine Warm-up	15	Weight and Balance Chart PT-23	22
4. Engine and Accessories Ground Test.	15	Weight and Balance Chart PT-26	23
5. Taxiing	16	Specific Engine Flight Chart PT-19, PT-19A, and PT-19B	24
6. Take-off	16	Specific Engine Flight Chart PT-23	25
7. Engine Failure During Take-off	16	Specific Engine Flight Chart PT-26	26
8. Climbing	16	Take-off, Climb and Landing Chart PT-19	27
9. Flight	16	Take-off, Climb and Landing Chart PT-19A	28
10. Engine Failure During Flight	16	Take-off, Climb and Landing Chart PT-19B	29
11. Approach for Landing	17	Take-off, Climb and Landing Chart PT-23	30
12. Landing	17	Take-off, Climb and Landing Chart PT-26	31
13. Emergency Take-off if Landing is not Completed	17	Flight Operation Instruction Chart PT-19	32
Appendix		Flight Operation Instruction Chart PT-19A	33
I Glossary of Terms	37	Flight Operation Instruction Chart PT-19B	34
II Emergency Instructions	38	Flight Operation Instruction Chart PT-23	35
III Extreme Weather Notes	38	Flight Operation Instruction Chart PT-26	36

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NOTE: A heavy black vertical line, to the left of the text on revised pages, indicates the extent of the revision. This is omitted where more than 50 percent of the page is revised.

PT-19 ★ PT-19A ★ PT-19B

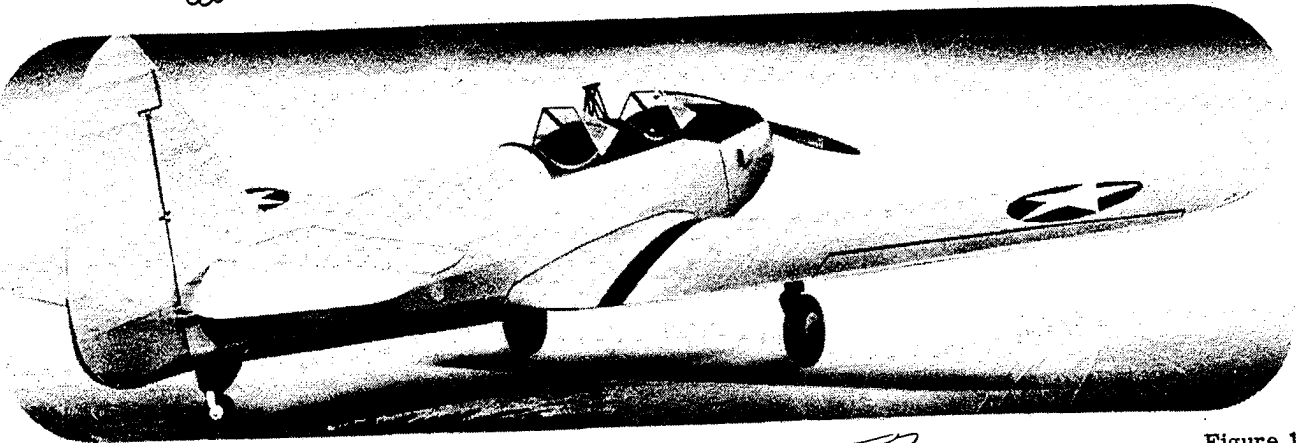


Figure 1

PT-23

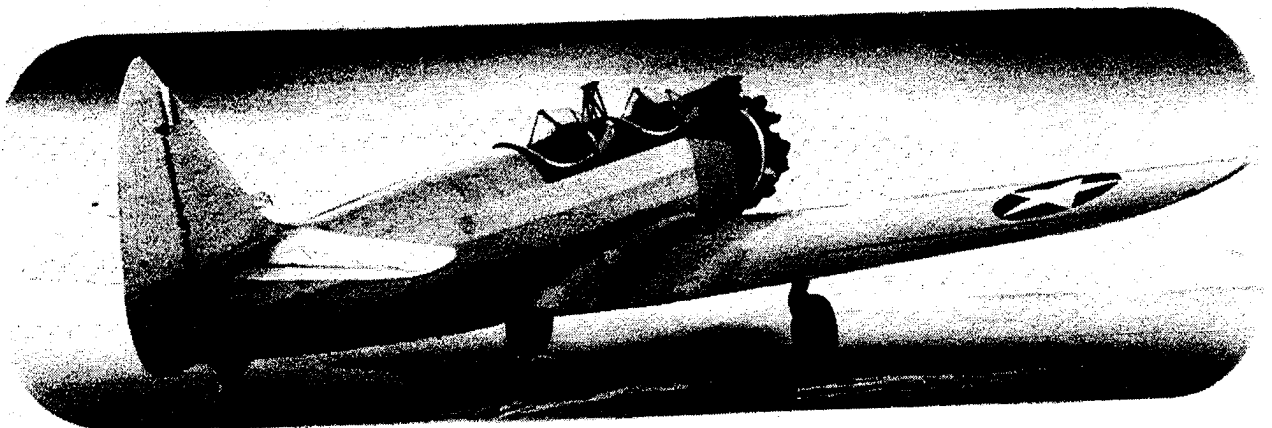


Figure 2

PT-26

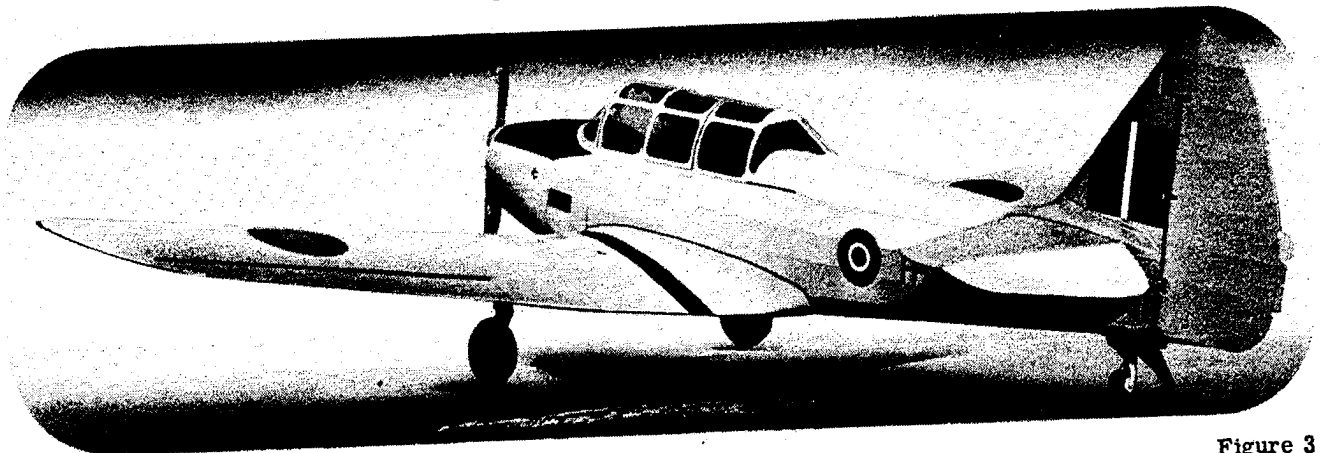


Figure 3

SECTION I

INTRODUCTION

1. This Handbook describes the Operation and Flight Instructions for Models PT-19, PT-19A, PT-19B, PT-23, and PT-26 airplanes manufactured by the Fairchild Aircraft Division of the Fairchild Engine and Airplane Corporation, Hagerstown, Maryland, and the Aeronca Aircraft Corporation, Middletown, Ohio, Fleet Aircraft, Limited, Fort Erie, Ontario, Howard Aircraft Corporation, Chicago, Illinois, and St. Louis Aircraft Corporation, St. Louis Missouri.

2. While all of the subject models are similar in appearance, the equipment of each differs as explained in the text. When no mention is made of any differences, the instructions given include all models. Each paragraph which contains description or instructions applicable only to certain models is headed by the models to which it specifically refers.

3. In some cases one particular airplane may not conform exactly to the description given of it in this Handbook. The reason for this is that the Handbook has been written to cover the majority of airplanes built, and changes in various models occur from time to time which cannot always be anticipated. For example, the PT-23 airplane was designed to use an oil dilution system. The first few PT-23 airplanes were not equipped with an oil dilution system because of various shortages which made it impossible at the time of production. It is expected that the oil dilution system will be installed in these airplanes in the field when the parts become available.

SECTION II

DESCRIPTION

1. AIRPLANES.

a. GENERAL. - Models PT-19, PT-19A, PT-19B, PT-23, and PT-26 are identical in primary design and construction. All are cantilever low-wing monoplanes with fabric-covered welded steel tube fuselage, fixed landing gear, plywood-covered wood center section and outer wing panels. All are two-place with tandem seating arrangement. The PT-26 is equipped with an enclosure over both cockpits. Other models are open cockpit. Power plants are as follows:

PT-19, PT-19A, and PT-19B	Ranger L-440-1	175 hp
PT-23	Continental R-670-4	220 hp
PT-26	Ranger L-440-3	200 hp

b. ACCESS TO AIRPLANES. - A walkway on the center section on the left side of the airplane is provided on the PT-19. All other models have walkways on both sides. The enclosure on the PT-26 is opened by lifting the trip lever (figure 4) which extends outside the enclosure frame. A handhole is provided on the left side of the fuselage to assist in entering the airplane.



Figure 4 - Model PT-26 Canopy Latch

c. FUEL AND OIL.

(1) FUEL.

(a) PT-19, PT-19A, PT-19B ONLY. - Seventy-three octane fuel should be used. Sixty-five octane may be used in emergency.

(b) PT-23 ONLY. - Sixty-five octane fuel must be used.

(c) PT-26 ONLY. - Ninty-one octane fuel should be used but fuel between 80 and 91 octane may be used if necessary.

(2) OIL (ALL MODELS).

(a) For normal operation an oil of SAE viscosity 60 is used. Army-Navy Aeronautical Specification No. AN-VV-O-446, grade 1120.

(b) In extreme cold weather SAE viscosity 50 is used.

(c) In extreme hot weather SAE viscosity 70 is used.

d. EMERGENCY EQUIPMENT. - A hand-type fire extinguisher is located on the rear of the fire wall, accessible from the front cockpit or through the door

marked "Fire Extinguisher" in the left fuselage cowl just above and forward of the leading edge of the center section. (See figure 5.) A welded steel turnover structure is provided between both cockpits to prevent injury to occupants in event of nose-over. No special emergency exits are provided. On the PT-26, occupants should open the enclosure fully in the normal manner by grasping the handle and trip lever and sliding enclosure section to "FULL-OPEN" position.

CAUTION

DO NOT USE THE FIRE EXTINGUISHER INSIDE COCKPIT DURING FLIGHT WITHOUT FIRST OPENING THE ENCLOSURE (PT-26).

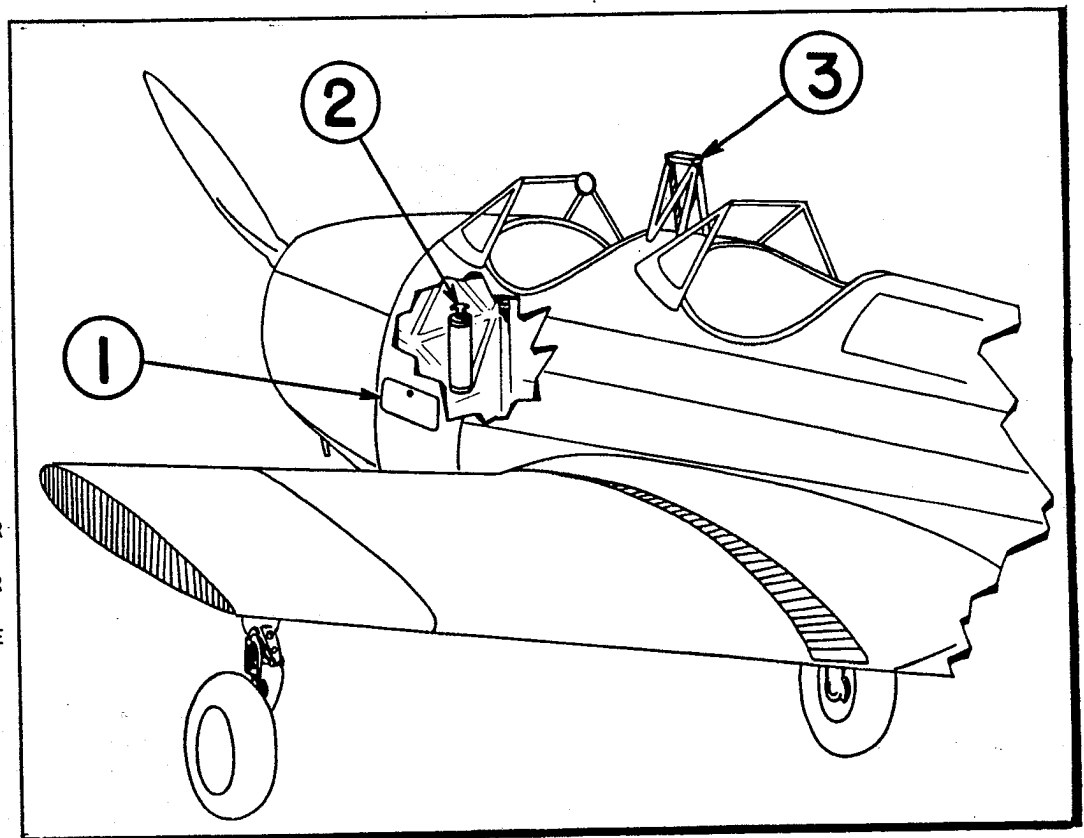
2. POWER PLANTS.

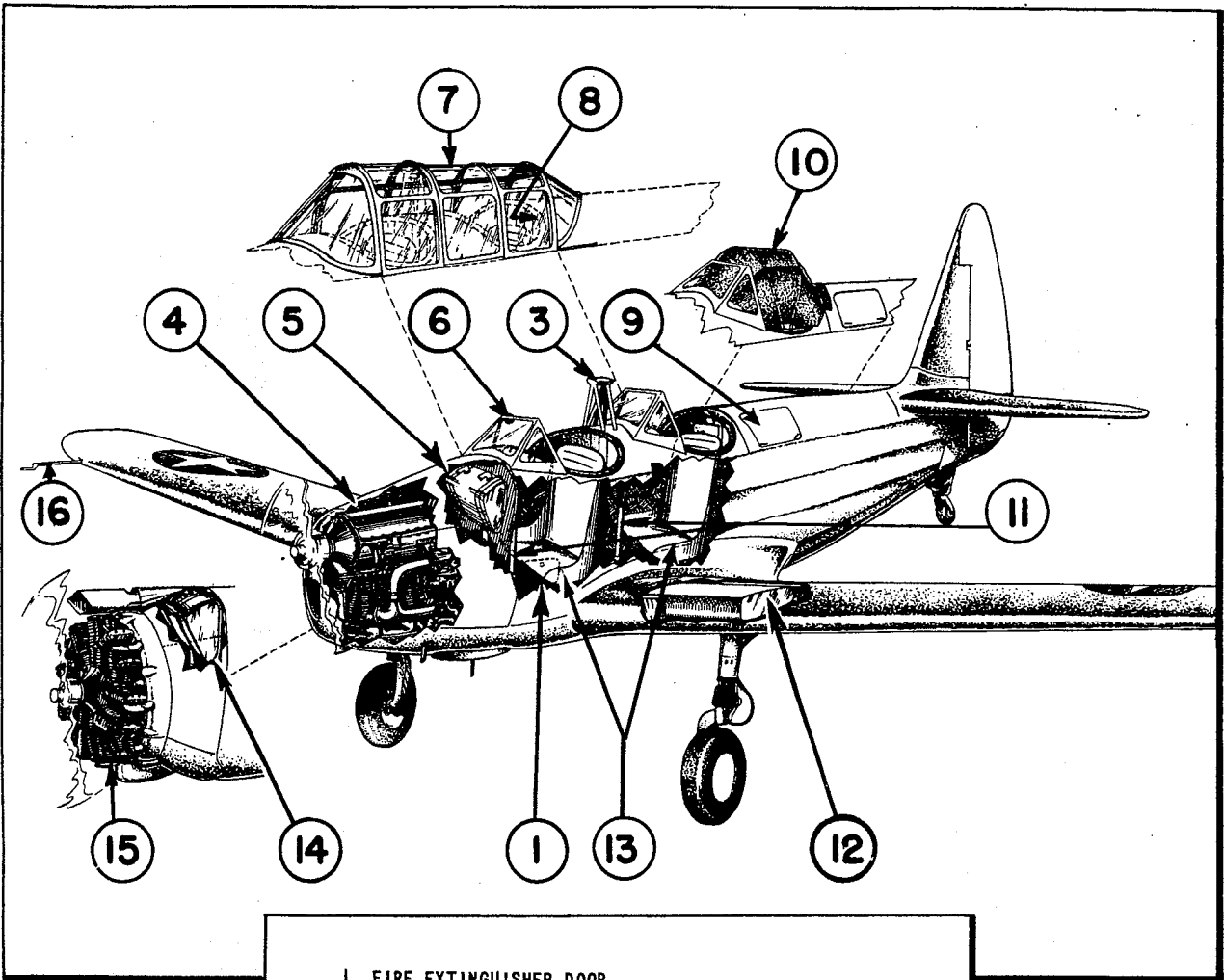
a. PT-19, PT-19A, AND PT-19B. - These are powered by the Ranger L-440-1 six-cylinder in-line air-cooled engine driving a two-bladed fixed pitch wood propeller, Sensenich model 86-R-61 mounted on a Warner hub, model 7900. This engine has a compression ratio of 6:1 and is rated at 175 horse power at 2450 rpm at sea level.

b. PT-23. - This is powered by the Continental R-670-4 seven-cylinder radial air-cooled engine driving a two-bladed fixed pitch wood propeller, Sensenich

Figure 5 -
Emergency
Equipment
- All Models

1. FIRE EXTINGUISHER DOOR
2. FIRE EXTINGUISHER
3. TURN OVER STRUCTURE





- 1. FIRE EXTINGUISHER DOOR
- 2. TURN OVER STRUCTURE
- 3. POWER PLANT - PT-19, PT-19A, PT-19B, PT-26
- 4. OIL TANK - PT-19, PT-19A, PT-19B, PT-26
- 5. REARVIEW MIRROR
- 6. COCKPIT ENCLOSURE - PT-26
- 7. BAGGAGE COMPARTMENT - PT-26
- 8. BAGGAGE COMPARTMENT - PT-19, PT-19A, PT-19B, PT-23
- 9. BLIND FLYING HOOD - PT-19B, PT-23, PT-26
- 10. CONTROL STICKS
- 11. LEFT FUEL TANK
- 12. ADJUSTABLE SEATS
- 13. OIL TANK - PT-23
- 14. POWER PLANT - PT-23
- 15. PITOT TUBE

Figure 6 - Fuselage Contents Arrangement - All Models

model 90-LA-77 mounted on a 98-29524B hub. This engine has a compression ratio of 5.4:1 and is rated at 220 horse power at 2075 rpm at sea level.

six-cylinder in-line air-cooled engine driving a two-bladed fixed pitch wood propeller, Sensenich model 86-R-61 mounted on a Warner hub, model 7900. This engine has a compression ratio of 7.5:1 and is rated at 200 horse power at 2450 rpm at sea level.

c. PT-26. - This is powered by the Ranger L-440-3

3. CONTROLS AND OPERATIONAL EQUIPMENT.

a. AIRPLANE CONTROLS.

(1) **COCKPIT SEATS.** - Seats are adjustable. Adjustment is accomplished by lifting handle on right side of seat and sliding up or down to desired position, then the handle is released.

(2) **AILERON AND ELEVATOR.** - Conventional dual stick control is provided. Either stick may be removed by removal of a single bolt through socket at bottom of stick. Controls are push-pull rod type with ball-bearing rod ends.

(3) **RUDDER, BRAKES, AND TAIL WHEEL.** - Rudder and tail wheel operate together through a single system of push-pull rods with ball-bearing rod ends. A spring-loaded rod operates the tail wheel steering mechanism from the right rudder horn. Tail wheel is steerable up to the extreme positions of rudder travel and automatic full swivel beyond these positions. Rudder pedals may be adjusted by use of the lever extending upward on the inside of the pedal quadrants. Three different positions are available. After adjusting pedals, make certain that left and right pedals are in the same position. The hydraulic brakes are operated by depressing the toe pedals.

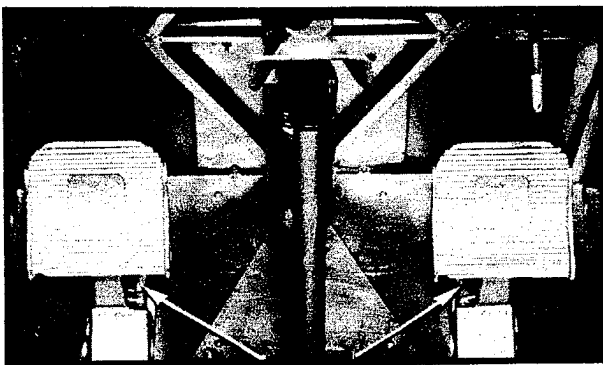


Figure 7 - Rudder Pedal Adjustment Levers

PARKING BRAKE. - The parking brake is operated by a lever on the right side of either cockpit. Depress toe brakes, move parking brake lever up and aft as far as it will go and then move it down. This holds the pressure in the hydraulic brake system. To release, depress toe brakes and return lever to "OFF" position.

CAUTION

BE SURE TO CHECK PARKING BRAKE FOR "OFF" POSITION BEFORE ATTEMPTING TO TAXI.

(4) **ELEVATOR TABS.** - A tab control unit is located on the left side of each cockpit. Each is interconnected with the other. The handle is rotated clockwise, as viewed from the face for "Nose-Down" adjustment and counterclockwise for "Nose-Up."

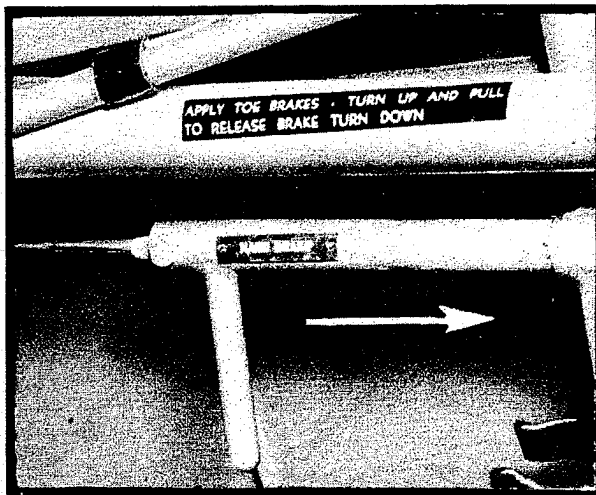


Figure 8 - Parking Brake - Front Cockpit

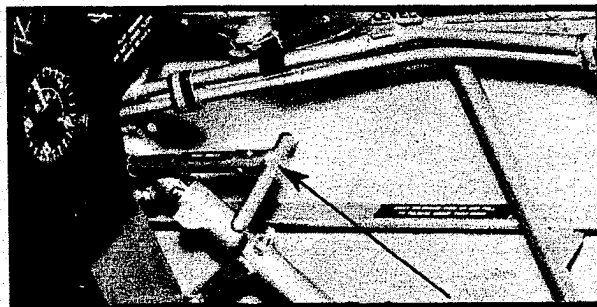


Figure 9 - Parking Brake - Rear Cockpit

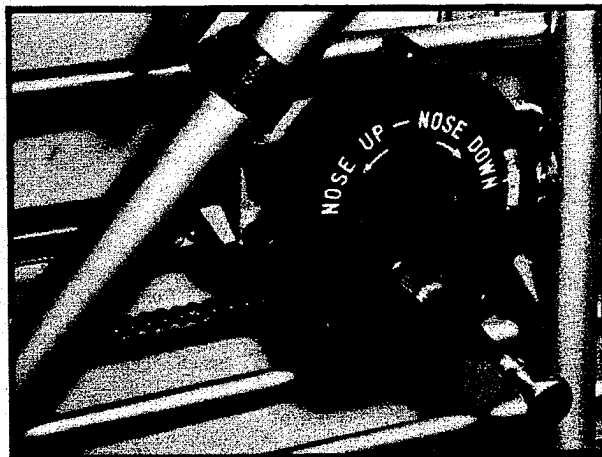
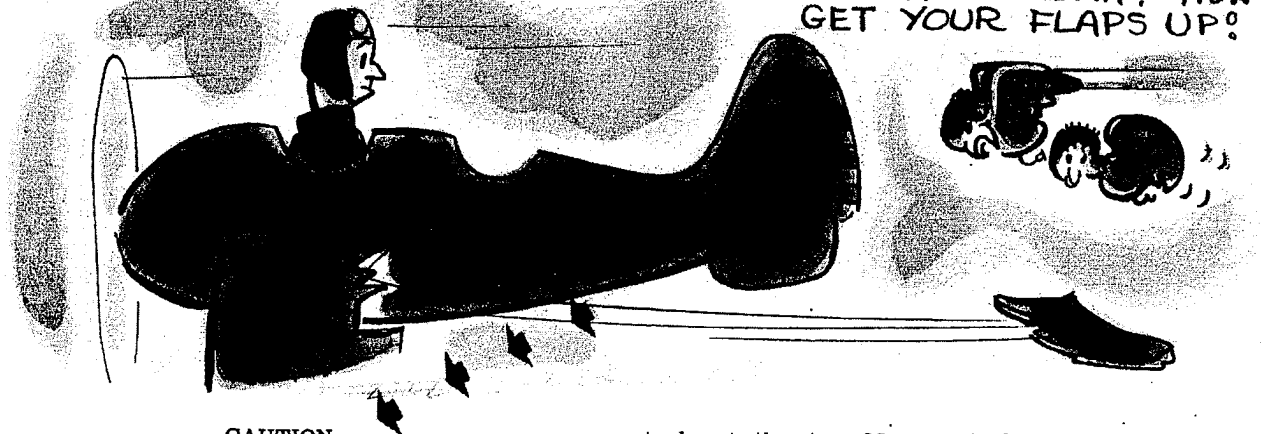


Figure 10 - Tab Control

(5) **FLAP CONTROLS.** - Flaps are adjusted by means of the lever on the left side of either cockpit. The lever is moved all the way back and released at last notch for "FULL-DOWN" position. Reverse procedure is followed to move flaps "up." Flaps may be adjusted to "HALF-DOWN" position by releasing the lever so it locks in the middle notch.

STAMATY.



CAUTION

DO NOT LOWER FLAPS WHEN INDICATED AIR SPEED EXCEEDS 95 MPH.

(6) SURFACE CONTROL LOCK. - This system consists of a latch, holding the control sticks in full forward centered position, and a pair of cams which lock the rudder pedals in neutral position. The latch and cams are interconnected.

(a) FRONT COCKPIT OPERATION. - Move the lock handle to rear position. Center rudder pedals and release all pressure from pedals. Move stick forward into socket of latch. To unlock, move stick slightly forward and remove the latch from the stick.

Control up to the stop. Move control stick aft and release wire pull.

CAUTION

NO PRESSURE SHOULD BE APPLIED TO THE RUDDER PEDALS WHILE OPERATING THE LOCK.

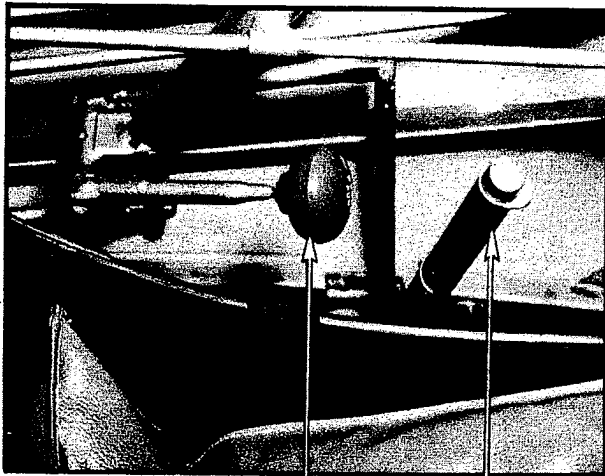


Figure 11 - Wobble Pump and Flap Control

17. WOBBLE PUMP

18. FLAP LEVER

(b) REAR COCKPIT OPERATION. - Pull wire control up to the stop. Center rudder pedals and release all pressure from pedals. Center stick and move it to full forward position. Release the wire pull. To unlock, move stick slightly forward and pull wire con-



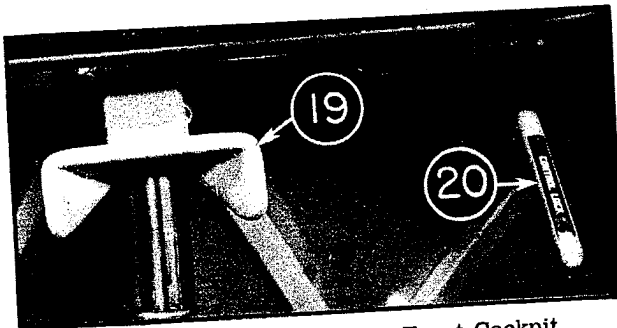


Figure 12 - Control Lock - Front Cockpit
19. STICK LATCH 20. LOCK HANDLE

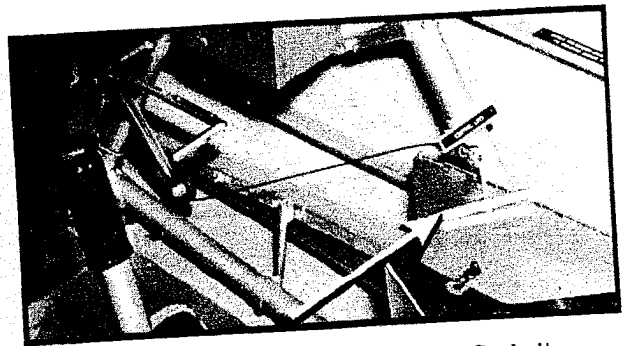


Figure 13 - Control Lock - Rear Cockpit

- 21. AIRSPEED INDICATOR
- 22. COMPASS
PT-19, PT-19A -
FRONT COCKPIT ONLY
PT-19B, PT-23 -
REAR COCKPIT ONLY
PT-26 - BOTH
COCKPITS
- 23. ENGINE GAGE UNIT
- 24. TACHOMETER
- 25. PT-19, PT-19A -
FRONT COCKPIT ONLY
PT-19B, PT-23 -
BOTH COCKPITS
PT-26 - REAR COCKPIT
ONLY
- 26. ALTIMETER
- 27. CARBURETOR AIR HEAT
CONTROL
- 28. INSTRUMENT LIGHT
SWITCH AND RHEOSTAT
- 29. NAVIGATION LIGHT
SWITCH
- 30. TURN AND BANK
INDICATOR
- 31. RATE OF CLIMB
INDICATOR
- 32. VOLTAGE BOOSTER
(INVERTER) SWITCH
- 33. GYRO HORIZON
- 34. LANDING LIGHT
SWITCH
- 35. GENERATOR BRAKE
CONTROL PT-26 -
FRONT COCKPIT ONLY
- 36. AMMETER
PT-26 - FRONT
COCKPIT ONLY
- 37. DIRECTIONAL GYRO
- 38. SUCTION GAGE
- 39. OIL DILUTION SWITCH
- 40. TAIL LIGHT SWITCH
- 41. COCKPIT HEATER
CONTROL
- 42. WING LIGHTS SWITCH

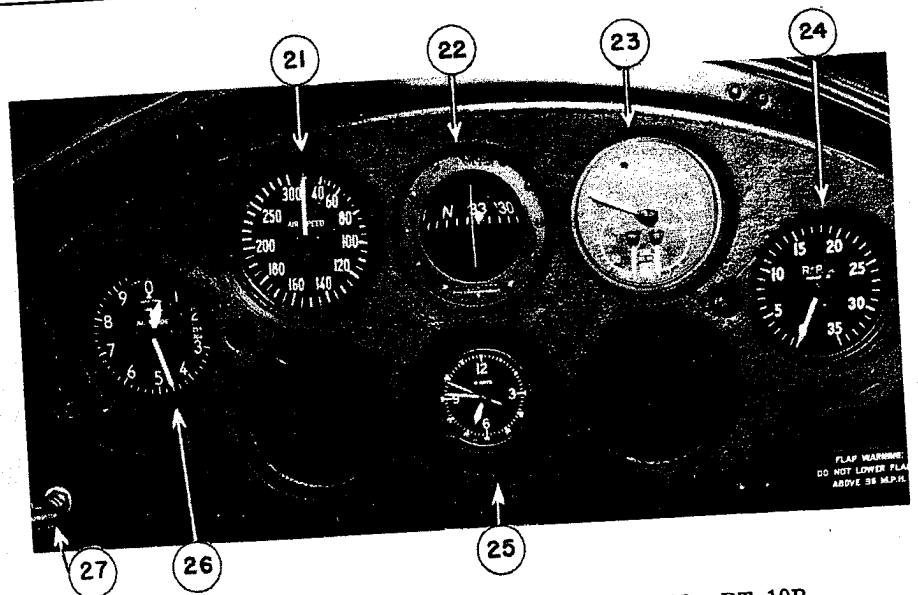
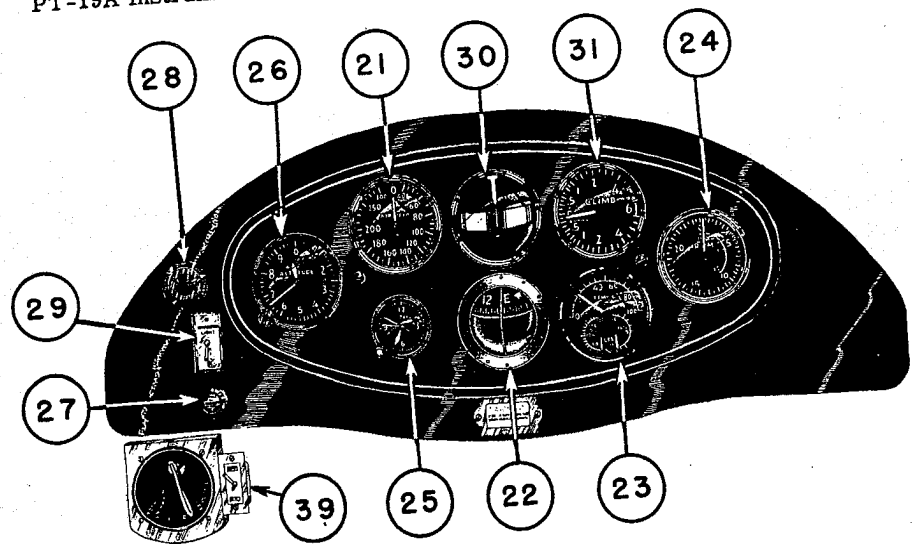


Figure 14 - PT-19,
PT-19A Instrument Panel

Figure 15 - PT-19B,
PT-23, Instrument Panel



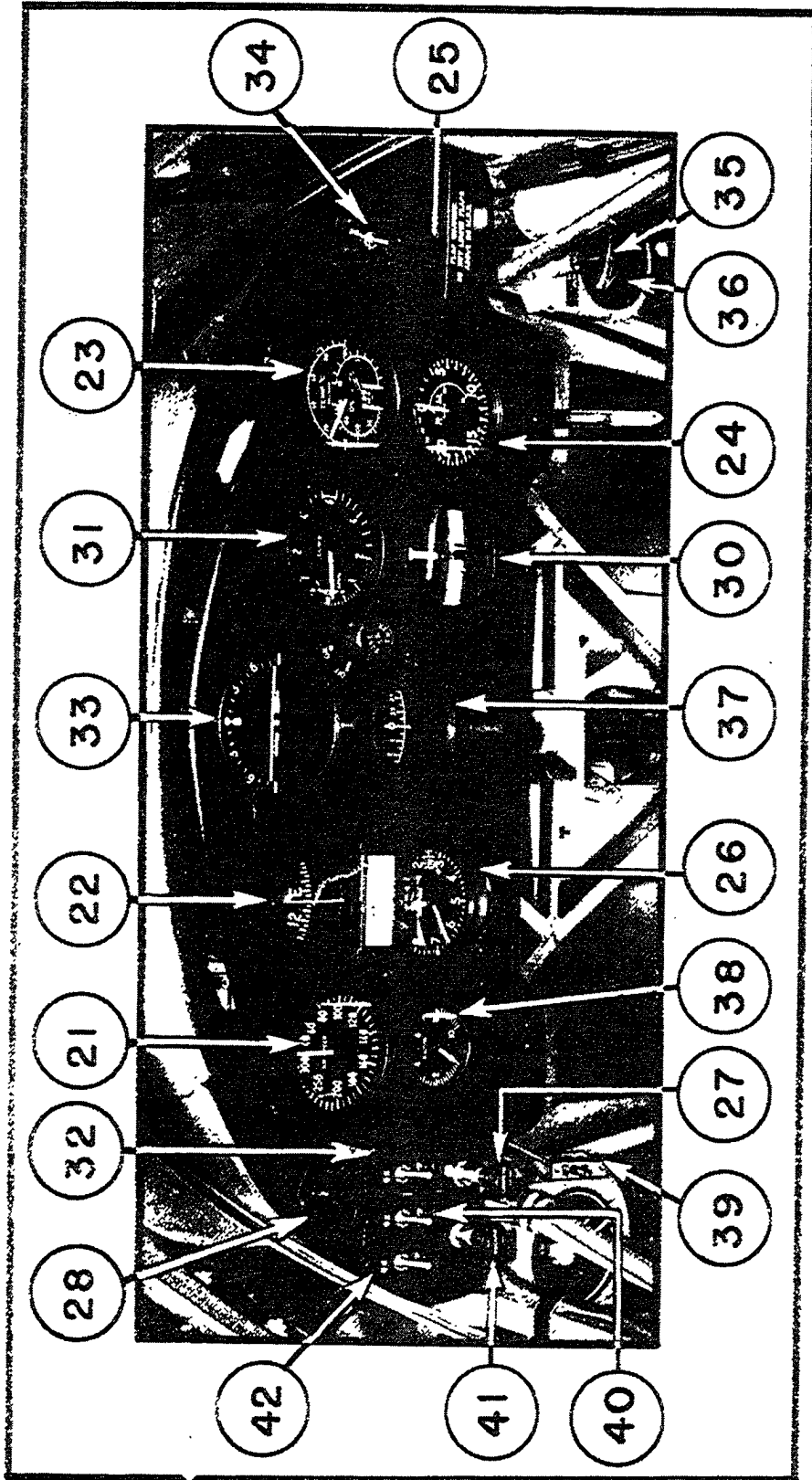


Figure 16 - PT-26 Instrument Panel

- 21. AIR SPEED INDICATOR
- 22. COMPASS
PT-19, PT-19A - FRONT COCKPIT ONLY
PT-19B, PT-23 - REAR COCKPIT ONLY
PT-26 - BOTH COCKPITS
- 23. ENGINE GAGE UNIT
- 24. TACHOMETER
- 25. CLOCK
PT-19, PT-19A - FRONT COCKPITS ONLY
PT-19B, PT-23 - BOTH COCKPITS
PT-26 - REAR COCKPIT ONLY
- 26. ALTIMETER
- 27. CARBURETOR AIR HEAT CONTROL
- 28. INSTRUMENT LIGHT SWITCH AND RHEOSTAT
- 30. TURN AND BANK INDICATOR
- 31. RATE OF CLIMB INDICATOR
- 32. VOLTAGE BOOSTER (INVERTER) SWITCH
- 33. GYRO HORIZON
- 34. LANDING LIGHT SWITCH
- 35. GENERATOR BRAKE CONTROL
PT-26 - FRONT COCKPIT ONLY
- 36. ANMETER
- 37. PT-26 - FRONT COCKPIT ONLY
- 37. DIRECTIONAL GYRO
- 38. SUCTION GAGE
- 39. OIL DILUTION SWITCH
- 40. TAILLIGHT SWITCH
- 41. COCKPIT HEATER CONTROL
- 42. WING LIGHTS SWITCH

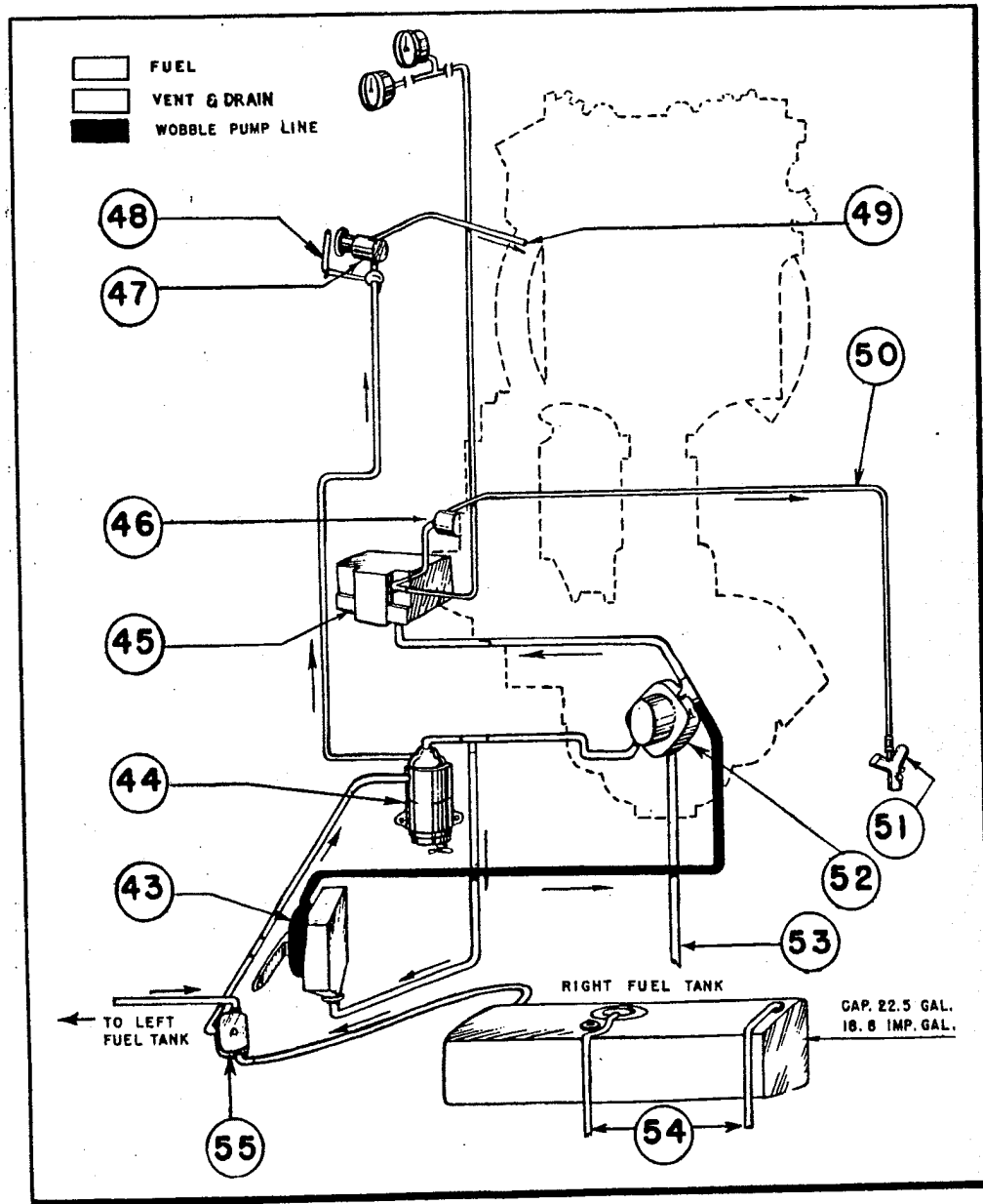


Figure 17 - Fuel System - PT-19, PT-19A, PT-19B, PT-26

- | | | |
|--|---|--------------------------|
| 43. WOBBLE PUMP | 48. PRIMER SHUT-OFF | 52. FUEL PUMP |
| 44. FUEL STRAINER | 49. PRIMER LINE TO MANIFOLD | 53. DRAIN LINE FROM PUMP |
| 45. CARBURETOR | 50. OIL DILUTION LINE (PT-19B, PT-23, PT-26 ONLY) | 54. TANK VENT LINES |
| 46. SOLENOID (PT-19B, PT-23, PT-26 ONLY) | 51. Y-DRAIN VALVE | 55. FUEL SELECTOR VALVE |
| 47. PRIMER | | |

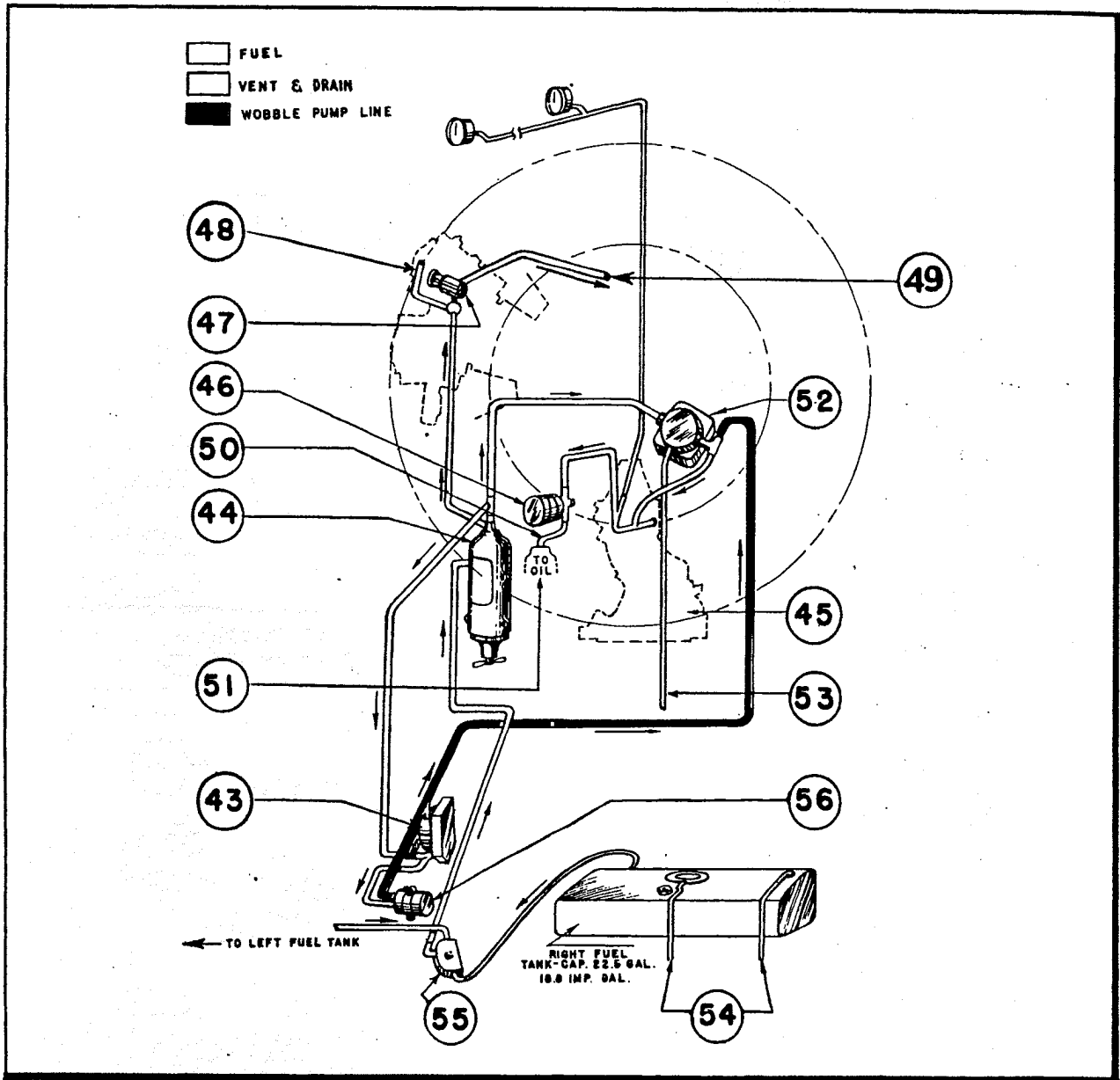
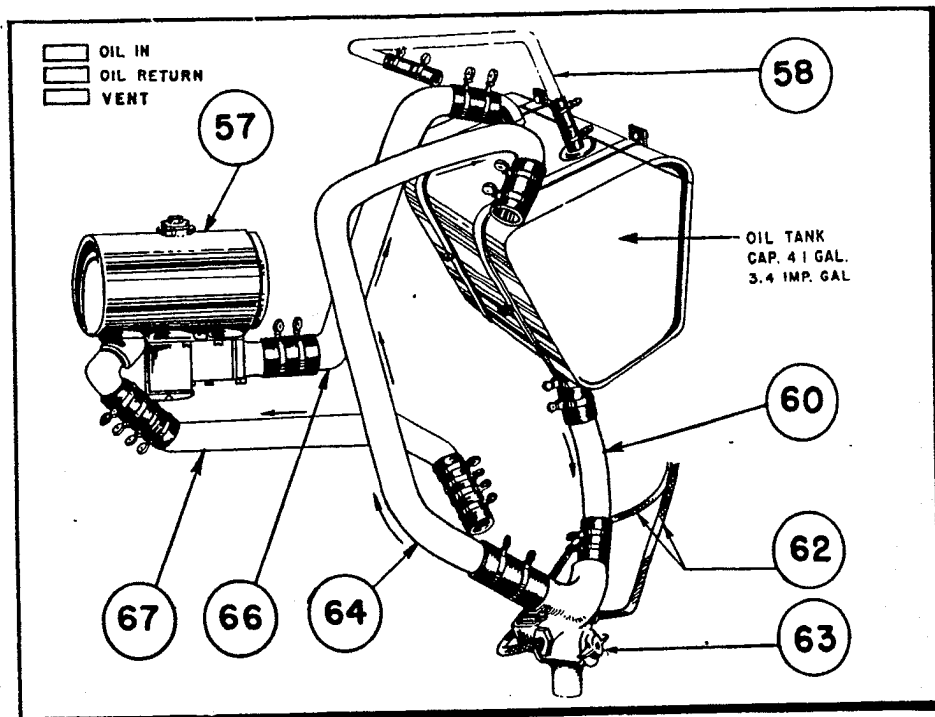


Figure 18 - Fuel System - PT-23

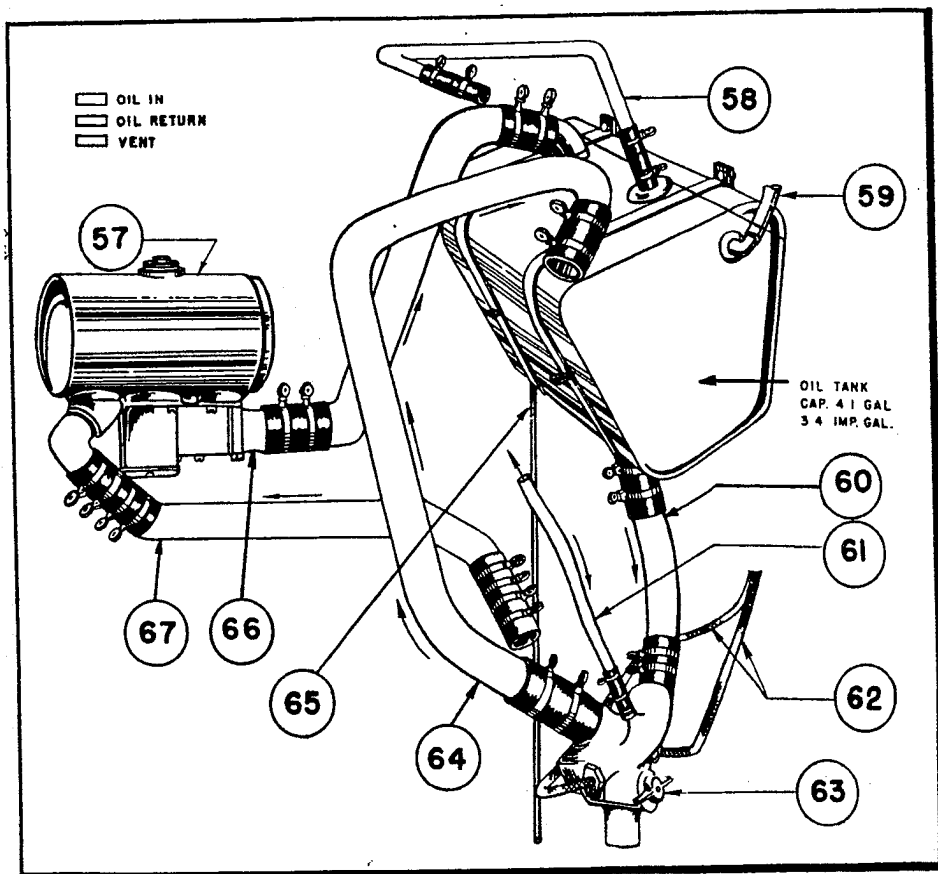
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|--|---|--|
| 43. WOBBLE PUMP | 49. PRIMER LINE TO MANIFOLD | 54. TANK VENT LINES |
| 44. FUEL STRAINER | 50. OIL DILUTION LINE (PT-19B, PT-23, PT-26 ONLY) | 55. FUEL SELECTOR VALVE |
| 45. CARBURETOR | 51. Y-DRAIN VALVE | 56. RELIEF VALVE (TYPE A-1) USED ONLY WITH F-10 FUEL PUMP. NOT USED WITH G-6 FUEL PUMP |
| 46. SOLENOID (PT-19B, PT-23, PT-26 ONLY) | 52. FUEL PUMP | |
| 47. PRIMER | 53. DRAIN LINE FROM PUMP | |
| 48. PRIMER SHUT-OFF | | |



- 57. OIL TEMPERATURE REGULATOR (COOLER)
- 58. TANK VENT LINE
- 59. LINE TO OIL SEPARATOR
- 60. OIL "IN" LINE AND TANK DRAIN
- 61. OIL DILUTION LINE TO SOLENOID
- 62. OIL TEMPERATURE LINES

Figure 19 - Oil System - PT-19, PT-19A
 Figure 20 - Oil System - PT-19B, PT-26

- 63. DRAIN VALVE
- 64. OIL "IN" LINE AND ENGINE DRAIN
- 65. SCUPPER DRAIN LINE
- 66. OIL RETURN LINE, COOLER TO TANK
- 67. OIL RETURN LINE, ENGINE TO COOLER
 ENGINE BREATHER LINE AND PRESSURE LINES NOT SHOWN.



- 68. OIL RETURN LINE
- 69. VENT LINE, ENGINE TO TANK
- 70. OIL TEMPERATURE AND PRESSURE LINES
- 71. SCUPPER DRAIN LINE
- 72. OIL "IN" LINE AND TANK DRAIN
- 73. ENGINE BREATHER LINE
- 74. DRAIN VALVE
- 75. OIL "IN" LINE AND ENGINE DRAIN
- 76. OIL DILUTION LINE TO SOLENOID

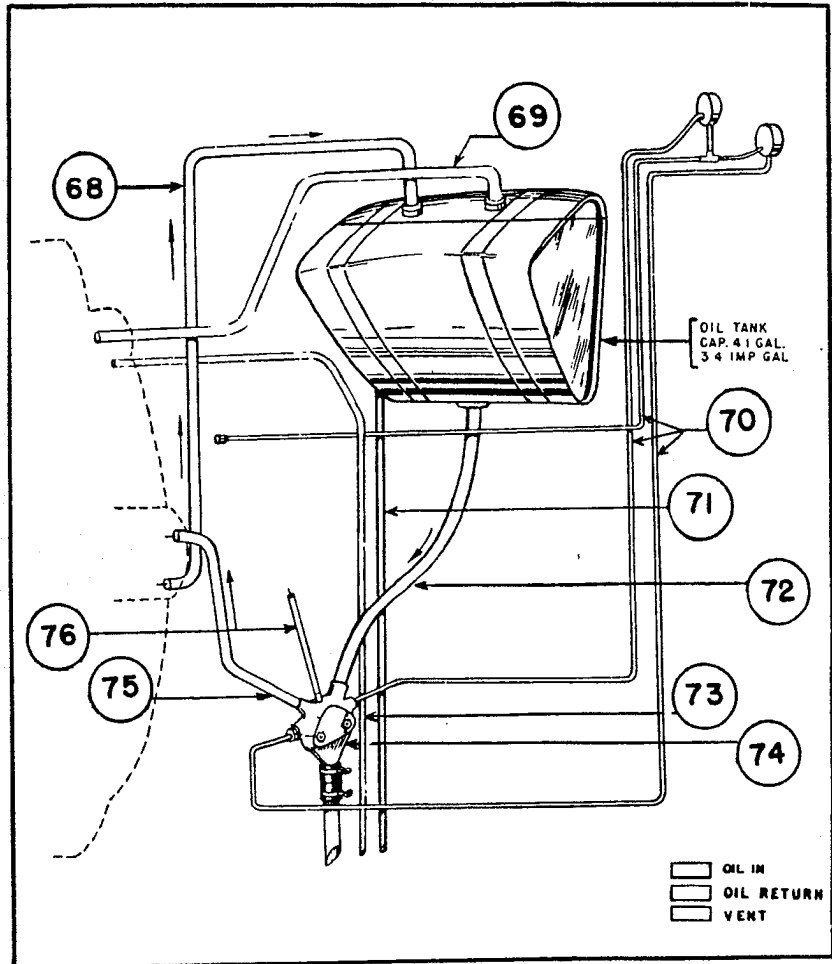


Figure 21 - Oil System PT-23

b. **FUEL SYSTEM.** - The center wing section is fitted with two fuel tanks, one on each side of the fuselage. Capacity of each tank is 22.5 gallons (18.7 Imperial gallons). There is no reserve or auxiliary tank. Each tank is filled by first removing the cover plate, held in place by a Dzus fastener, in the top surface of the center section. The filler cap is directly beneath the cover plate. PT-26 ONLY has a grounding jack, outboard from each tank cover plate, into which the fuel grounding wire should be plugged while filling tanks. A direct reading magnetic fuel gage, visible from both cockpits, is fitted into the top of each tank and projects through the top surface of the center section. The gage is correct only when in flying position. A conventional fuel selector valve is located on the left side of each cockpit below the instrument panel. When turning valve, be careful to feel that it is seated in the new position. In building

up fuel pressure prior to starting the engine, three or four strokes of the wobble pump handle are used. This handle is mounted on the left side of each cockpit by the seat. A pressure of 2.5 to 3.5 pounds is desired to start the engine which is then maintained by the engine-driven fuel pump. The hand-operated wobble pump is used in the event the engine-driven pump fails in flight.

c. **OIL SYSTEM.** - The oil tank is secured to the engine mount, and filler cap is accessible through a door in the engine cowl. Tank capacity is 4.1 gallons (3.4 Imperial gallons).

(1) PT-19, PT-19A, PT-19B, PT-26 ONLY...- Maximum permissible pressure is 60 pounds per square inch. Minimum 40 pounds per square inch. Desired pressure is 55 pounds per square inch.

(2) PT-23 ONLY. - Maximum permissible pressure is 90 pounds per square inch. Minimum 60 pounds per square inch. Desired pressure is 75 pounds per square inch.

(3) OIL DILUTION - PT-19B, PT-23, PT-26 ONLY. - For cold weather starting or emergency operation, a switch below the left side of instrument panel is provided to allow fuel to flow into the oil lines and dilute the oil. This switch should never be left "ON" over 15 seconds at any one time and should be used prior to stopping the engine at the end of an operation period so as to facilitate the next starting.

d. ELECTRICAL SYSTEM - PT-19B, PT-23 ONLY. Electric power is supplied by a 24-volt engine-driven generator through a 24-volt storage battery mounted on the rear structure of the front seat. The master switch is on the right side of the front cockpit and may be operated only in the front cockpit. Master switch must be turned "ON" before operation of any electrical equipment.

(1) NAVIGATION LIGHTS. - Switch for navigation lights is on left side of each instrument panel. "DOWN" position of switch is momentary and turns navigation light "ON" for signalling purposes only. Use "UP" position of switch for constant operation of lights.

(2) INSTRUMENT LIGHTS. - Rheostat to adjust amount of light desired is on left side of each panel. Each light is manually operated on a ball socket fitting on the left side of each cockpit.

(3) INTERPHONE. - A type RC-73-A electrical interphone system permits conversation from front to rear cockpit only. The microphone is of conventional "press-to-talk" type.

(4) PT-26 ONLY. - Electrical system is similar to that in the PT-19B and PT-23 but is 12 volts instead of 24 volts, and electrical interphone is not installed. The generator is wind-driven, mounted on the lower side of the center section. A generator brake control below the right side of the front instrument panel is used to stop the generator when desired. The engine-driven generator is not used. An ammeter adjacent to the generator brake control indicates the charging rate. A voltage "booster" or inverter, operated by a switch on the left side of each panel, is used in the instrument light system to step the voltage up to 24. One switch is provided for wing navigation lights and another for tail navigation light, both on left side of each panel. PT-26 has a landing light in the right wing operated by a switch on the right side of each panel. Master switch may be turned "ON" in the front or rear cockpit.

(5) PT-19 AND PT-19A. - No electrical equipment.

e. ENGINE CONTROLS.

(1) THROTTLE CONTROL. - Conventional.

(2) MIXTURE CONTROL. - Full forward for full-rich mixture on all models except PT-26. On PT-26

full aft for full-rich mixture and forward for lean mixture.

(3) IGNITION SWITCHES. - A conventional ignition switch is installed in the left side of the front cockpit which may also be controlled from the rear cockpit through an extension, mounted through a dummy switch.

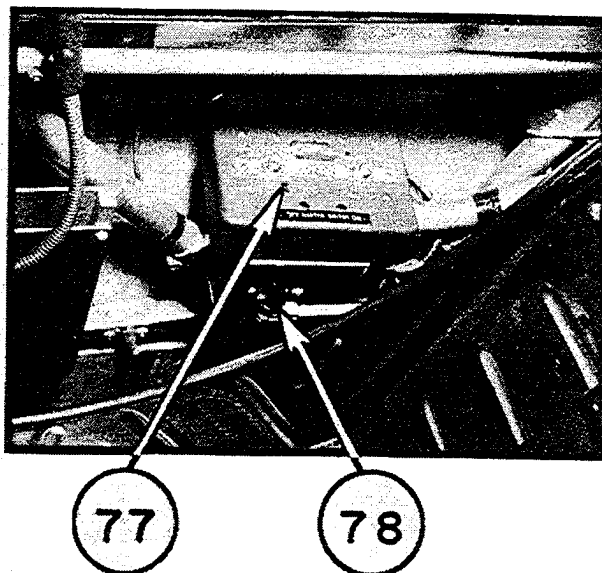
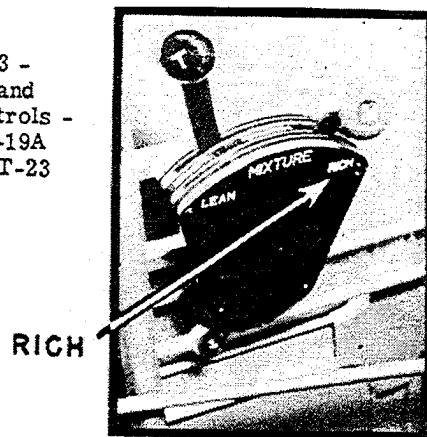


Figure 22 - Fuse Box and Master Switch - PT-26

77. FUSE BOX 78. MASTER SWITCH

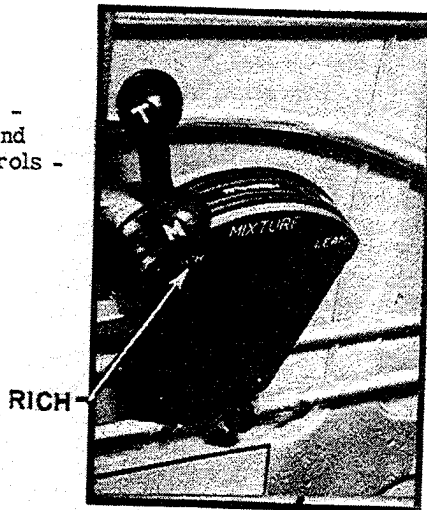
Figure 23 -
Throttle and
Mixture Controls -
PT-19, PT-19A
PT-19B, PT-23



(4) CARBURETOR HEATER CONTROL. - Located on left side of each instrument panel. Pull full out to "ON" position at the slightest indication of carburetor icing.

f. HEATING AND VENTILATING EQUIPMENT - PT-26 ONLY. - Main heater valve is operated by a control on the left side of either cockpit. Individual shutters in the floor of each cockpit, operated by the occupant, control the amount of heat released to each

Figure 24 -
Throttle and
Mixture Controls -
PT-26



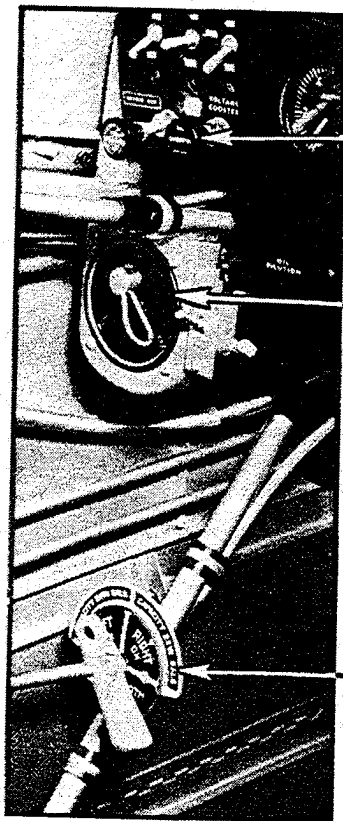
eration of the turn and bank indicators, gyro horizons, and directional gyros. This system eliminates the use of venturi tubes and requires no operation by the pilot. On **PT-26 ONLY** a suction gage connected with the system is on the left side of each instrument panel. Three and one-half to 4 inches of mercury should be indicated for proper operation of the system.

(b) **PT-23 ONLY.** - Vacuum is obtained by the use of two type A-3 venturi tubes and no engine-driven vacuum system is installed.

(2) **SPEAKING TUBE - PT-19, PT-19A, PT-26 ONLY.** - A nonelectric speaking tube is provided for communication from front to rear cockpit. Other models have electric interphone system as described in paragraph (4) under "Electrical System."

(3) **BAGGAGE COMPARTMENT.** - Starter crank is stowed in baggage compartment when not in use. It is held in place by clips fastened to baggage compartment door or floor.

(a) **PT-19, PT-19A, PT-19B, PT-23 ONLY.** - A 3-cubic foot baggage compartment is located inside rear deck and is accessible through door in left side of rear deck.



CARBURETOR
HEATER
CONTROL

IGNITION
SWITCH

FUEL
SELECTOR
VALVE

Figure 25 -
Controls,
Left Side

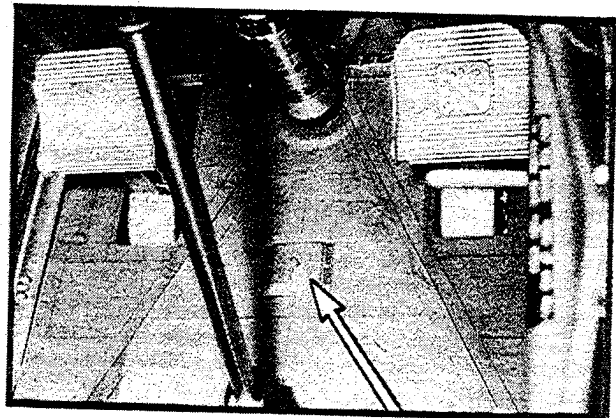


Figure 26 - Cockpit Heater Shutter - PT-26

cockpit. For normal ventilation the cockpit enclosure may be opened to the first position in either or both cockpits.

g. MISCELLANEOUS FUSELAGE EQUIPMENT.

(1) INSTRUMENTS AND CONTROLS.

(a) **VACUUM SYSTEM - PT-19B, PT-26 ONLY.** An engine-driven vacuum pump supplies a vacuum through an oil separator and relief valve for the op-

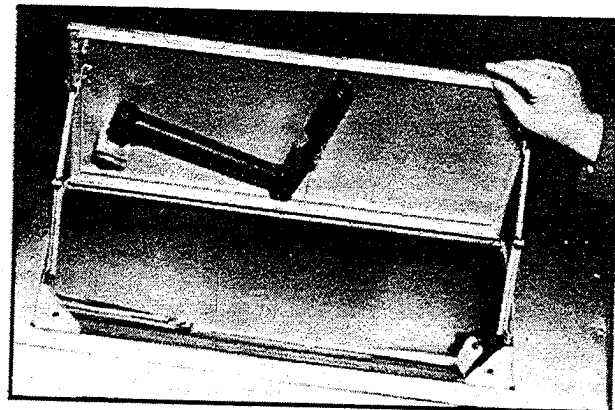


Figure 27 - Baggage Compartment -
PT-19, PT-19A, PT-19B, PT-23

(b) PT-26 ONLY. - Baggage compartment is accessible through door behind rear seat.

(4) REARVIEW MIRROR. - A round adjustable rearview mirror is located on the top right portion of the front windshield.

(5) FLIGHT REPORT HOLDER. - A type A-2 flight report holder is provided in the front cockpit.

(6) DATA CASE. - A data case is provided in the rear cockpit.

(7) SAFETY BELTS.

(a) PT-19 and PT-19A ONLY through AAF serial No. 42-34061 are equipped with standard safety belts. PT-19A after AAF serial No. 42-34062 incorporates two Sutton-type shoulder harnesses.

(b) PT-19B, PT-23, and PT-26 are equipped with Sutton-type shoulder harnesses.

(8) BLIND FLYING HOOD - PT-19B, PT-23, PT-26 ONLY. - For instrument flying instructions, a hood is provided in the rear cockpit. It is pulled forward by the occupant over his head. When not in use it is held back of the seat by shock cord tension on both sides of the cockpit.

4. FLYING CHARACTERISTICS.

a. GENERAL. - All models are exceptionally stable over a wide speed range and under all normal locations of the center of gravity. Lateral control is good down to the stall point. Controls are all of ball-bearing type, hence very responsive and light. General flight characteristics are good. PT-23 ONLY of the five models, the PT-23 is comparatively light at the tail, but this condition does not make the flight or ground characteristics appreciably different from the other models.

b. TAXYING. - The steerable and automatic swivel tail wheel contributes to the ease of taxiing. Brakes have no tendency to grab, and the airplane is easy to handle even in severe cross-winds. Do not use brakes any more than necessary in taxiing.

c. TAKE-OFF. - Take-off speed for all models is about 60 mph. This speed gives a clean take-off without any tendency to bounce or struggle into the air. The use of flaps for take-off is not recommended. During take-off, right rudder pressure is necessary to counteract for torque until flying speed is attained.

d. CLIMBING. - Elevator tab should be adjusted to properly trim the airplane immediately after leav-

ing the ground. This adjustment usually is to the "O" mark on the elevator tab indicators. Full throttle should be used for all climbs to assure proper engine cooling. Best climbing speed for all models is 80 mph.

e. NORMAL FLIGHT. - Elevator tab should be adjusted for level flight depending upon the individual loading condition. Correct engine rpm for cruising:

(1) PT-19, PT-19A, PT-19B - 2050 rpm.

(2) PT-23 - 1800 rpm.

(3) PT-26 - 2050 rpm.

f. STALLS. - A complete stall is followed by an abrupt drop of the nose with no tendency for the airplane to fall off on either wing. On PT-23 nose must be brought up higher than on other models for full stall. Right rudder is used in all power stalls to compensate for torque. Stalling speeds are:

(1) PT-19, PT-19A - 58 mph.

(2) PT-19B, PT-23, PT-26 - 61 mph.

Recovering from stalls should not be attempted at less than 80 mph.

g. SPINS. - The spinning characteristics of all models are good, and recovery should be made with full opposite rudder, followed immediately by momentarily applying forward stick pressure.

h. DIVING. - Diving above 220 mph is prohibited.

i. AEROBATICS. - All models are adequately stressed for all regularly taught aerobatics. Inverted flight for protracted periods of time will result in cutting off the fuel supply to the engine.

j. MANEUVERS PROHIBITED. - Outside loops and any maneuvers producing negative loads must not be attempted.

k. APPROACH FOR LANDING. - Trim the airplane to glide in at 80 mph. NEVER LOWER FLAPS OVER 95 MPH. The use of half flaps is recommended in primary training stages and full flaps for later stages of training.

l. LANDING. - Landing characteristics are conventional. The wide landing gear, low center of gravity location and steerable tail wheel contribute to the absence of any tendency to ground loop. In making cross-wind landings, a normal approach is made and drift removed immediately before touching the ground.

SECTION III

FLIGHT OPERATING INSTRUCTIONS

PT-19, PT-19A, PT-19B, AND PT-26

1. ON ENTERING THE COCKPIT.

a. SPECIAL CHECK FOR NIGHT FLYING -
PT-19B and PT-26 ONLY.

- (1) Master Switch "ON."
- (2) Voltage booster switch "ON" (PT-26 ONLY).
- (3) Instrument light rheostat "ON."
- (4) Test operate navigation lights; one switch on PT-19B, two on PT-26.
- (5) Test operate landing light (PT-26 ONLY).

b. CHECK FOR ALL FLIGHTS.

- (1) Ignition switch "OFF."
- (2) Flaps "UP."
- (3) Disengage control lock and check freedom of movement of flight controls.
- (4) Parking brake "ON."
- (5) Fuel selector valve on "RIGHT" or "LEFT" tank.
- (6) Throttle "CLOSED."
- (7) Mixture "FULL RICH."
- (8) Carburetor air heat "OFF" (in).

2. STARTING ENGINE.

- a. Pull engine through with ALL SWITCHES OFF.
- b. Master switch "ON" (PT-19B, PT-26, and PT-23 ONLY).
- c. Pump fuel to carburetor with wobble pump - 3- to 4-pound indicated pressure (PT-23 - 2 to 3 pounds).

d. Pump throttle 2 or 3 sharp strokes and leave open about 1/2 inch. (Except on PT-23, use 5 or 6 shots of primer and open throttle about 1/2 inch.)

e. COLD WEATHER. - Use 2 or 3 shots of primer and about 4 sharp strokes of throttle. In extremely cold weather a rapid pumping of the throttle near "CLOSED" position may be required during the first

half minute or so after engine starts. On PT-23 use 6 to 8 shots of primer only. Do not pump throttle on PT-23.

f. Ignition switch on "LEFT." On all models except PT-23 on which model the ignition switch should be placed on "BOTH."

g. Start engine with direct-cranking hand starter on PT-19, PT-19A, PT-19B, and PT-26. On PT-23 hand inertia starter is used.

h. Ignition switch placed on "BOTH" as soon as engine starts on the model PT-19, PT-19A, PT-19B, and PT-26 airplanes.

i. Set throttle for 750 to 1000 rpm until oil pressure begins to rise.

WARNING

STOP ENGINE IF OIL PRESSURE DOES NOT REGISTER WITHIN 30 SECONDS AFTER STARTING.

3. ENGINE WARM-UP.

a. Warm up engine between 800 and 900 rpm on PT-19, PT-19A, PT-19B, and PT-26; between 700 and 800 rpm on PT-23 ONLY.

b. When oil temperature starts to rise, increase rpm to 1200.

4. ENGINE AND ACCESSORIES GROUND TEST.

a. After warm-up has been completed, minimum wide-open ground rpm should be 1900 on PT-19, PT-19A, PT-19B, and PT-26. Minimum wide-open ground rpm should be 1810 on PT-23 ONLY.

b. Check each magneto momentarily. Maximum drop on either magneto 75 rpm. On PT-23 ONLY maximum drop should be 50 rpm at 1500 rpm.

c. Minimum oil pressure should be 40 to 50 pounds.

d. Desired normal oil pressure, PT-23 ONLY, 60 to 80 pounds. Minimum oil temperature should be 30°C (86°F).

e. Fuel pressure should be 3 to 4 pounds on PT-19, PT-19A, PT-19B, and PT-26; 2 to 3 pounds on PT-23 ONLY.

f. Release parking brake.



5. TAXYING.

a. Flaps "UP."

b. Keep clear of tall grass, mud holes, and loose stones. Turn ship as necessary to maintain good forward visibility; taxi slowly.

6. TAKE-OFF.

a. PREFLIGHT CHECK.

(1) TAB CONTROL.

6 RED (nose-down), both seats occupied.
6 RED (nose-down), rear seat only occupied.
3 RED (nose-down), front seat only occupied.

(2) Mixture "FULL-RICH."

(3) Carburetor air heat "OFF" (in), unless icing conditions are present.

(4) Flaps "UP."

(5) Fuel selector valve on RIGHT or LEFT tank.

(6) Check flight controls for free operation.

b. Throttle "WIDE OPEN."

c. Readjust tab control as necessary as soon as ship is in the air.

7. ENGINE FAILURE DURING TAKE-OFF.

a. Ignition switch "OFF."

b. Drop nose and maintain a gliding speed of about 80 mph STRAIGHT AHEAD. DO NOT ATTEMPT TO TURN BACK INTO THE FIELD.

c. Open cockpit enclosure (PT-26 ONLY).

8. CLIMBING.

a. All climbs are made with FULL THROTTLE to assure proper engine cooling.

b. Best climbing speed is 80 mph.

9. FLIGHT.

a. Refer to paragraph 4., section II, and to section V.

b. Cruising, 2050 rpm and maximum cruising 2150 rpm for PT-19, PT-19A, PT-19B, and PT-26. Cruising 1800 rpm and maximum cruising 1850 rpm for PT-23 ONLY.

c. Maximum allowable rpm 2600 for PT-19, PT-19A, PT-19B, and PT-26, and 2490 rpm for PT-23 ONLY.

d. Maximum allowable speed 220 mph.

e. Oil pressure should be 40 pounds minimum and 60 pounds maximum for PT-19, PT-19A, PT-19B, and PT-26; for PT-23 ONLY, 60 pounds minimum 90 pounds maximum.

f. Oil temperature should be 60°C (140°F) to 80°C (176°F) normal; 93°C (199°F) maximum. PT-23 ONLY, 95°C (203°F) maximum.

g. Fuel pressure should be 3 to 4 pounds on PT-19, PT-19A, PT-19B, and PT-26; 2 to 3 pounds on PT-23 ONLY.

h. Suction (vacuum system) should be 3-1/2 to 4 inches of mercury (PT-26 ONLY).

i. Mixture should be "FULL RICH" under 5,000 feet. Adjust for smooth operation above 5,000 feet.

j. Carburetor air heat "OFF" (in) unless required by icing conditions.

10. ENGINE FAILURE DURING FLIGHT.

a. Follow applicable instructions in paragraphs 11., and 12. below.

b. Ignition switch "OFF" in glide.

c. Master switch "OFF" after landing.

11. APPROACH FOR LANDING.

a. Fuel selector valve turned to tank containing most fuel.

b. Mixture "FULL RICH."

c. Carburetor air heat "OFF" (in) unless required by icing conditions.

d. Flaps "DOWN." Use of half flaps is recommended in primary training stages, full flaps for advanced stages. DO NOT LOWER FLAPS ABOVE 95 MPH.

e. Gliding speed, 80 mph.

f. Adjust tab control as required.

g. Open cockpit enclosure (PT-26 ONLY).

12. LANDING.

a. Land the airplane gently. Do not attempt to get down too rapidly and do not level off too high.

b. CROSS-WIND LANDING. - Proceed as in normal landing and remove all drift just before touching the ground.

c. Flaps "UP" after rolling to a stop.

13. EMERGENCY TAKE-OFF IF LANDING IS NOT COMPLETED.

a. Throttle "WIDE OPEN."

b. Flaps "UP" gradually, after reaching 80 mph and 200 feet altitude.

14. STOPPING ENGINE.

a. Apply toe brakes and engage parking brake.

b. When air temperature is below 0°C (32°F) use oil dilution switch before stopping engine if airplane is not to be used again within 30 minutes to 1 hour (PT-19B, PT-23, and PT-26 ONLY).

c. Throttle "CLOSED."

d. Mixture "FULL LEAN" for idle cut-off.

e. Ignition switch "OFF" after propeller has stopped rotating.

15. BEFORE LEAVING THE COCKPIT.

a. Fuel selector valve "OFF."

b. All light switches "OFF" (PT-19B, PT-23, and PT-26 ONLY).

c. Master switch "OFF" (PT-19B, PT-23, and PT-26 ONLY).

d. Engage control lock.

16. MANEUVERS PROHIBITED.

a. Outside loops.

b. Any maneuvers which might impose negative loads on any part of the airplane.

c. Snap rolls in excess of 100 mph.

d. Immelman turns in excess of 170 mph.

e. Slow rolls in excess of 150 mph.

f. Indicated air speed in excess of 191 mph.

SECTION IV

FLIGHT OPERATION DATA

1. DETERMINING GROSS WEIGHT.

a. Refer to the "WEIGHT AND BALANCE CHART" in this section for the applicable model airplane, and check the listed basic and alternate tabulated items against those loaded in the airplane. If the airplane is loaded in accordance with the "Basic Load Items" whose weights are entered in the "Pounds" column, and, the "Alternate Items" whose weights are entered under two loading conditions in the "Alternate Loading (Pounds)" column, the gross weight will be found listed at the bottom of the chart. If any items tabulated in the "Pounds" columns are omitted in the loading of the airplane, deduct the weight of the missing items from the "Gross Weight," and the answer will be correct gross weight as the airplane is actually loaded.

b. Baggage, not to exceed the allowable weight listed under "Alternate Items," may be carried when secured with tie-down straps in the baggage compartment.

2. FLIGHT PLANNING.

The following outline may be used as a guide to assist personnel in the use of the FLIGHT OPERATION INSTRUCTION CHART for flight planning purposes.

a. If the flight plan calls for a continuous flight where the desired cruising power and air speed are reasonably constant after take-off and climb to 5000 feet, the fuel required and flight time may be computed as a "single section flight."

(1) Within the limits of the airplane, the fuel required and flying time for a given mission depend

largely upon the speed desired. With all other factors remaining equal in an airplane, speed is obtained at a sacrifice of range, and range is obtained at a sacrifice of speed. The speed is usually determined after considering the urgency of the flight plotted against the range required. The time of take-off is adjusted so as to have the flight arrive at its destination at the predetermined time.

(2) Select the FLIGHT OPERATION INSTRUCTION CHART for the model airplane and gross weight to be used at take-off. Locate the largest figure entered under G.P.H. (gallons per hour) in column 1 on the lower half of the chart. Multiply this figure by the number and/or fraction of hours desired for reserve fuel. Add the resulting figure to the number of gallons set forth in footnote No. 2, and subtract the total from the amount of fuel in the airplane prior to starting of engine. The figure obtained as a result of this computation will represent the amount of gasoline available and applicable for flight planning purposes on the RANGE IN AIR MILES section of the FLIGHT OPERATION INSTRUCTION CHART.

(3) Select figure in fuel column equal to, or the next entry less than, available amount of fuel in airplane as determined in paragraph 2.a.(2) above. Move horizontally to right or left and select a figure equal to, or the next entry greater than, the air miles to be flown. Values contained in the column in which this figure appears, represent highest cruising speed possible at range desired; the airplane may be operated in accordance with values contained under OPERATING DATA in any column of a higher number with flight plan being completed at a sacrifice of speed but at greater fuel economy.

(4) Using the same column number selected by application of instructions contained in paragraph 2.a.(3), determine the IAS and gallons per hour listed at sea level in the lower section of chart under subtitle

OPERATING DATA. Divide this IAS into air miles to be flown and obtain the calculated flight duration in minutes, convert into hours and minutes and deduct from desired arrival time at destination in order to obtain the take-off time (without consideration for wind). To allow for wind, use the above IAS as ground speed and calculate a new corrected ground speed with the aid of a flight calculator or navigator's triangle of velocities.

(5) Airplane and engine operating values listed below OPERATING DATA in any single numbered column are calculated to give constant miles per gallon at any altitude listed. Thus, airplane may be operated at any altitude and at the corresponding set of values given provided they are in the same column listing the range desired.

CAUTION

Ranges listed in column 1 under "Max Cont Power" are correct only at altitude given in footnote 1. Engine and airplane operating data listed under OPERATING DATA will give constant miles per gallon if operation is consistent with values set opposite listed altitudes.

(6) Flight plan may be changed at any time en route, and the chart will show the balance of range at various cruising powers.

b. If the original flight plan calls for a mission requiring changes in power, speed, gross load or external load, in accordance with "GR. WT." or "EXTERNAL ITEMS" increments shown in the series of "FLIGHT OPERATION INSTRUCTION CHARTS" provided, the total flight should be broken down into a series of individual short flights, each computed as outlined in paragraph 2.a. in its entirety, and then added together to make up the total flight and its requirements.

SPEC. AN-H-8 DEC. 18, 1942 <small>FORM ASC-513</small>		WEIGHT & BALANCE CHART			
AIRPLANE MODELS		CG LIMITS (IN INCHES) AFT OF REFERENCE DATUM LINE			
		CONDITION	F'W'D	AFT	
.....		TAKE-OFF	20% M.A.C.30%..	
.....PJ-19.....		LANDING	20% M.A.C.30%..	
BASIC WEIGHT ITEMS					POUNDS
WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)					1770
EQUIPMENT:					
NAVIGATION _____ LB.		PHOTOGRAPHIC _____ LB.		OXYGEN _____ LB.	
PYROTECHNICS (FLARES, ETC.) _____ LB.					
ARMAMENT:					
FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.					
FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.					
CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.					
RADIO: MODEL(S) _____					
TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)					1770
ITEMS OF USEFUL LOAD			ALTERNATE LOADINGS (POUNDS)		
			MAXIMUM FUEL		
PILOT (200 LB. INCLUDING PARACHUTE)			200		
CREW (200 LB. EACH INCLUDING PARACHUTE) (Student)			200		
PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)					
BAGGAGE (_____ LB. MAXIMUM)					
FUEL (6 LB./U.S. GAL. OR 7.2 LB./IMP. GAL.):			270		
OIL (7.5 LB./U.S. GAL. OR 9 LB./IMP. GAL.):			30		
EXTRA TANK(S) INSTALLATION					
BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH					
() EXTERNAL AT _____ LB. EACH					
TORPEDO INSTALLATION					
AMMUNITION					
() RD. OF _____ CAL.; () RD. OF _____ CAL.					
() RD. OF _____ MM.; () RD. OF _____ MM.					
NOTE: May be flown solo from either cockpit.					
GROSS WEIGHT			2470		
			% M.A.C.	29.5	

SPEC. AN-H-8 DEC. 18, 1942 <small>FORM ASC-513</small>	WEIGHT & BALANCE CHART							
	AIRPLANE MODELS	CG LIMITS (IN INCHES) AFT OF REFERENCE DATUM LINE	CONDITION	FWD AFT				
PT-19A.....		TAKE-OFF	.20% M.A.C.; ...30%...				
			LANDING	.20% M.A.C. ...30%...				
BASIC WEIGHT ITEMS				POUNDS				
WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)				1820				
EQUIPMENT:								
NAVIGATION	LB.	PHOTOGRAPHIC	LB.	OXYGEN	LB.			
PYROTECHNICS (FLARES, ETC.)				LB.				
ARMAMENT:								
FIXED GUN INSTALLATION(S):	()	CAL.	LB.;	()	CAL.	LB.;	GUN SIGHT	LB.
FLEXIBLE GUN INSTALLATION(S):	()	CAL.	LB.;	()	CAL.	LB.		
CANNON INSTALLATION(S):	()	MM.	LB.;	()	MM.	LB.		
RADIO: MODEL(S) _____								
TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)				1820				
ITEMS OF USEFUL LOAD		ALTERNATE LOADINGS (POUNDS)						
		MAXIMUM FUEL						
PILOT (200 LB. INCLUDING PARACHUTE)		200						
CREW (200 LB. EACH INCLUDING PARACHUTE) (Student)		200						
PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)								
BAGGAGE (_____ LB. MAXIMUM)								
FUEL (6 LB/U.S. GAL. OR 7.2 LB/IMP. GAL.):	U.S. GAL. (IMP. GAL.)							
	45 (37.4)	270						
	()							
	()							
	()							
	()							
OIL (7.5 LB/U.S. GAL. OR 9 LB/IMP. GAL.):	4.1 (3.4)	30						
	()							
EXTRA TANK(S) INSTALLATION								
BOMB INSTALLATION(S):	()	INTERNAL AT _____ LB. EACH						
	()	EXTERNAL AT _____ LB. EACH						
TORPEDO INSTALLATION								
AMMUNITION								
()	RD. OF _____ CAL.;	()	RD. OF _____ CAL.					
()	RD. OF _____ MM.;	()	RD. OF _____ MM.					
NOTE: May be flown from either cockpit.								
GROSS WEIGHT		2520						
		% M.A.C. 28.4						

WEIGHT & BALANCE CHART	
SPEC. AN-H-8 DEC. 18, 1942 FORM ASC-513	AIRPLANE MODELS, PT-19B.....
CG LIMITS (IN INCHES) AFT OF REFERENCE DATUM LINE	
CONDITION	F'W'D AFT
TAKE-OFF	.20% M.A.C. .30%...
LANDING	.20% M.A.C. .30%...
BASIC WEIGHT ITEMS	
WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)	1940
EQUIPMENT:	
NAVIGATION _____ LB. PHOTOGRAPHIC _____ LB. OXYGEN _____ LB.	
PYROTECHNICS (FLARES, ETC.) _____ LB.	
ARMAMENT:	
FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.	
FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.	
CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.	
RADIO: MODEL(S) _____	
TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)	
	1940
ITEMS OF USEFUL LOAD	ALTERNATE LOADINGS (POUNDS)
	MAXIMUM FUEL
PILOT (200 LB. INCLUDING PARACHUTE)	200
CREW (200 LB. EACH INCLUDING PARACHUTE) (Student)	200
PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)	
BAGGAGE (_____ LB. MAXIMUM)	
FUEL (6 LB/U.S. GAL. OR 7.2 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)	
	45 (37.4) 270
	()
	()
	()
	()
OIL (7.5 LB/U.S. GAL. OR 9 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)	
	4.1 (3.4) 30
	()
EXTRA TANK(S) INSTALLATION	
BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH	
() EXTERNAL AT _____ LB. EACH	
TORPEDO INSTALLATION	
AMMUNITION	
() RD. OF _____ CAL.; () RD. OF _____ CAL.	
() RD. OF _____ MM.; () RD. OF _____ MM.	
NOTE: May be flown solo from either cockpit.	
GROSS WEIGHT	
	2640
% M.A.C.	28.7

SPEC. AN-H-8 DEC. 18, 1942 FORM ASC-513	WEIGHT & BALANCE CHART			
AIRPLANE MODELS PT-23	CG LIMITS (IN INCHES) AFT OF REFERENCE DATUM LINE CONDITION TAKE-OFF LANDING	F'W'D 20% M.A.C. 20% M.A.C.	AFT 30% 30%	
BASIC WEIGHT ITEMS				POUNDS
WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)				1970
EQUIPMENT:				
NAVIGATION _____ LB.	PHOTOGRAPHIC _____ LB.	OXYGEN _____ LB.		
PYROTECHNICS (FLARES, ETC.) _____ LB.				
ARMAMENT:				
FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.				
FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.				
CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.				
RADIO: MODEL(S) _____				
TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)				1970
ITEMS OF USEFUL LOAD		ALTERNATE LOADINGS (POUNDS)		
		MAXIMUM FUEL		
PILOT (200 LB. INCLUDING PARACHUTE)		200		
CREW (200 LB. EACH INCLUDING PARACHUTE) (Student)		200		
PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)				
BAGGAGE (_____ LB. MAXIMUM)				
FUEL (6 LB./U.S. GAL. OR 7.2 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)				
	45 (37.4)	270		
	()			
	()			
	()			
	()			
	()			
OIL (7.5 LB./U.S. GAL. OR 9 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)				
	4.1 (3.4)	30		
	()			
EXTRA TANK(S) INSTALLATION				
BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH				
() EXTERNAL AT _____ LB. EACH				
TORPEDO INSTALLATION				
AMMUNITION				
() RD. OF _____ CAL.; () RD. OF _____ CAL.				
() RD. OF _____ MM.; () RD. OF _____ MM.				
NOTE: May be flown solo from either cockpit.				
GROSS WEIGHT		2670		
		% M.A.C. 27.0		

WEIGHT & BALANCE CHART													
SPEC. AN-H-8 DEC. 18, 1942 <small>FORM ASC-513</small>	CG LIMITS (IN INCHES) AFT OF REFERENCE DATUM LINE <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">AIRPLANE MODELS</th> <th style="text-align: left;">CONDITION</th> <th style="text-align: left;">F'W'D</th> <th style="text-align: left;">AFT</th> </tr> <tr> <td>.....</td> <td>TAKE-OFF</td> <td>.20% M.A.C.</td> <td>...30%...</td> </tr> <tr> <td>.....PT-26.....</td> <td>LANDING</td> <td>.20% M.A.C.</td> <td>...30%...</td> </tr> </table>	AIRPLANE MODELS	CONDITION	F'W'D	AFT	TAKE-OFF	.20% M.A.C.	...30%...PT-26.....	LANDING	.20% M.A.C.	...30%...
AIRPLANE MODELS	CONDITION	F'W'D	AFT										
.....	TAKE-OFF	.20% M.A.C.	...30%...										
.....PT-26.....	LANDING	.20% M.A.C.	...30%...										
BASIC WEIGHT ITEMS													
WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)	POUNDS												
	2010												
EQUIPMENT:													
NAVIGATION _____ LB. PHOTOGRAPHIC _____ LB. OXYGEN _____ LB.													
PYROTECHNICS (FLARES, ETC.) _____ LB.													
ARMAMENT:													
FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.													
FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.													
CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.													
RADIO: MODEL(S) _____													
TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)													
	2010												
ITEMS OF USEFUL LOAD	ALTERNATE LOADINGS (POUNDS)												
	MAXIMUM FUEL												
PILOT (200 LB. INCLUDING PARACHUTE)	200												
CREW (200 LB. EACH INCLUDING PARACHUTE) (Student)	200												
PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)													
BAGGAGE (_____ LB. MAXIMUM)													
FUEL (6 LB/U.S. GAL. OR 7.2 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)													
45 (37.4)	270												
()													
()													
()													
()													
()													
OIL (7.5 LB/U.S. GAL. OR 9 LB/IMP. GAL.):													
4.1 (3.4)	30												
()													
EXTRA TANK(S) INSTALLATION													
BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH													
() EXTERNAL AT _____ LB. EACH													
TORPEDO INSTALLATION													
AMMUNITION													
() RD. OF _____ CAL.; () RD. OF _____ CAL.													
() RD. OF _____ MM.; () RD. OF _____ MM.													
NOTE: May be flown solo from either cockpit.													
GROSS WEIGHT													
	2710												
% M.A.C.	29.3												

ENGINE MODELS
L-440-1
6-440 C-2

SPECIFIC ENGINE
FLIGHT CHART

AIRPLANE MODELS
PT-19, PT-19A, PT-19B

MAX. PERMISSIBLE DIVING R.P.M. 2940

CONDITION ALLOWABLE OIL CONSUMPTION
 "MAX CONTINUOUS" IMP PT/HR. 2.3 US. QT/HR.
 "ECONOMICAL MAX." IMP PT/HR. 1.4 US. QT/HR.
 "MIN. SPECIFIC" IMP PT/HR. 1.1 US. QT/HR.
 OIL GRADE: (S) 1120 (W) 1100A

FUEL OCTANE 73

5-1-42

OPERATING CONDITION	R.P.M.	MANIF. PRESS. (BOOST)	HORSE POWER	CRITICAL ALTITUDE (FEET)	USE LOW BLOWER BELOW	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.)		MAXIMUM CYL. TEMP. °C	MAXIMUM DURATION (MINUTES)	REMARKS	
							U.S.	IMP.				
TAKE-OFF	2450	F.T.	175	S.L.	FT. ALT.	F.R.*	19	16	260	500	5 MIN.	SAME AS TAKE-OFF
EMERGENCY MAXIMUM					FT. ALT.							
MAXIMUM CONTINUOUS	2450	F.T.	175	S.L.	FT. ALT.	F.R.*	19	16	240	464	CONT.	
ECONOMICAL MAXIMUM	2220	P.T.	131	S.L.	FT. ALT.	F.R.*	13	11	240	464	CONT.	
MINIMUM SPECIFIC CONSUMPTION	2060	P.T.	105	S.L.		F.R.*	9.8	8.2	240	464	CONT.	
MINIMUM CRUISING	2060	P.T.	105	S.L.	FT. ALT.	F.R.*	10	8.3	240	464	CONT.	

* NOTE: USE FULL RICH MIXTURE UP TO 5000 FEET, HAND LEAN ABOVE 5000 FEET.

NOTE: CRITICAL ALTITUDE IS THAT AT WHICH MAXIMUM POWER IS OBTAINED WITH FULL THROTTLE UNDER CONDITIONS SHOWN.

AIRPLANE MODELS				SPECIFIC ENGINE				ENGINE MODELS			
PT - 23				FLIGHT CHART				41-239			
CONDITION		FUEL PRESSURE LB./SQ. IN.	OIL PRESSURE LB./SQ. IN.	OIL TEMP. °C	COOLANT TEMP. °C	MAX. PERMISSIBLE DIVING R.P.M. 2490		CONDITION ALLOWABLE OIL CONSUMPTION			
DESIRED		2-3	60-80	60°-80°		"MAX CONTINUOUS"		IMP PT./HR. 1.5 U.S. QT./HR.			
MAXIMUM		4	80	95°		"ECONOMICAL MAX."		IMP PT./HR. 1 U.S. QT./HR.			
MINIMUM		2	60	40°		"MIN. SPECIFIC"		IMP PT./HR. .5 U.S. QT./HR.			
IDLING		1	30-40	40°		OIL GRADE: (S)		1120 (W) 1100A			
SUPERCHARGER TYPE: _____ FUEL OCTANE 73											
OPERATING CONDITION	R. P.M.	MANIF. PRESS. (BOOST)	HORSE POWER	CRITICAL ALTITUDE (FEET)	USE LOW BLOWER BELOW	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.) U.S.	MAXIMUM CYL. TEMP. °C	MAXIMUM DURATION (MINUTES)	REMARKS	
TAKE-OFF	2075	F. T.	220	S. L.	FT. ALT.	F. R. *	213	260°	526°		
EMERGENCY MAXIMUM					FT. ALT.					SAME AS TAKE-OFF	
MAXIMUM CONTINUOUS	2075	F. T.	220	S. L.	FT. ALT.	F. R. *	21	260°	526°	CONT.	
ECONOMICAL MAXIMUM	1890	P. T.	165	S. L.	FT. ALT.	F. R. *	18	235°	481°	CONT.	
MINIMUM SPECIFIC CONSUMPTION	1813	P. T.	147	S. L.	FT. ALT.	F. R. *	13	235°	481°	CONT.	
MINIMUM CRUISING	1750	P. T.	132	S. L.	FT. ALT.	F. R. *	12.2	235°	481°	CONT.	
* NOTE: USE FULL RICH MIXTURE UP TO 5000 FEET, HAND LEAN ABOVE 5000 FEET.											
NOTE: CRITICAL ALTITUDE IS THAT AT WHICH MAXIMUM POWER IS OBTAINED WITH FULL THROTTLE UNDER CONDITIONS SHOWN.											

5-1-42

AIRPLANE MODELS		ENGINE MODELS								
PT - 26		L-440-3								
SPECIFIC ENGINE FLIGHT CHART		6-440 C-5								
<p>51-42</p>		<p>MAX. PERMISSIBLE DIVING R.P.M.</p>								
CONDITION	FUEL PRESSURE LB./SQ. IN.	OIL PRESSURE LB./SQ. IN.	OIL TEMP. °C							
DESIRED	2.5 - 3.5	60	63 - 77							
MAXIMUM	4.5	70	93							
MINIMUM	2.5	50	63							
IDLING	1	15								
<p>COOLANT TEMP. °C</p>		<p>ALLOWABLE OIL CONSUMPTION</p>								
		<p>"MAX CONTINUOUS" IMP PT./HR. 2.65 US. QT./HR.</p>								
		<p>"ECONOMICAL MAX." IMP PT./HR. 1.6 US. QT./HR.</p>								
		<p>"MIN. SPECIFIC" IMP PT./HR. 1.3 US. QT./HR.</p>								
		<p>OIL GRADE: (S) 1120 (W) 1100 A</p>								
<p>FUEL OCTANE 91</p>										
<p>SUPERCHARGER TYPE:</p>										
OPERATING CONDITION	R.P.M.	MANIF. PRESS. (BOOST.)	HORSE POWER	CRITICAL ALTITUDE (FEET)	USE LOW BLOWER BELOW	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.) U.S. IMP.	MAXIMUM CYL. TEMP. °C	MAXIMUM DURATION (MINUTES)	REMARKS
TAKE-OFF	2450	F. T.	200	S. L.	FT. ALT.	F. R.	20	260	5 MIN.	SAME AS TAKE-OFF
EMERGENCY MAXIMUM					FT. ALT.					
MAXIMUM CONTINUOUS	2450	F. T.	200	S. L.	FT. ALT.	F. R.	20	240	464	CONT.
ECONOMICAL MAXIMUM	2220	P. T.	150	S. L.	FT. ALT.	F. R.	12.5	240	464	CONT.
MINIMUM SPECIFIC CONSUMPTION	2060	P. T.	120	S. L.		F. R.	8.6	240	464	CONT.
MINIMUM GRUISING	2060	P. T.	120	S. L.	FT. ALT.	F. R.	10	240	464	CONT.
<p>* NOTE: USE FULL RICH MIXTURE UP TO 5000 FEET, HAND LEAN ABOVE 5000 FEET.</p>										
<p>NOTE: CRITICAL ALTITUDE IS THAT AT WHICH MAXIMUM POWER IS OBTAINED WITH FULL THROTTLE UNDER CONDITIONS SHOWN.</p>										

AIRPLANE MODELS
P.T. - 19

ENGINE MODELS
L-440-1

TAKE-OFF, CLIMB & LANDING CHART

TAKE-OFF DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	HEAD WIND (MPH)	HARD SURFACE RUNWAY				SOFT SURFACE RUNWAY													
		AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.									
		GROUND RUN	TO CLEAR 50' OBL.	GROUND RUN	TO CLEAR 50' OBL.	GROUND RUN	TO CLEAR 50' OBL.	GROUND RUN	TO CLEAR 50' OBL.	GROUND RUN	TO CLEAR 50' OBL.								
2470 DUAL	0	800	1200	1100	1650	1600	2250	1300	1700	1800	2350	2600	3050	2600	3050	3600	4200	5300	6000
	20	450	750	600	1000	850	1400	700	1000	950	1400	1400	1900	1500	1750	2000	2400	2900	3400
	40	300	500	400	650	550	950	450	650	600	900	900	1250	900	1150	1300	1600	1800	2200
2270 SOLO	0	700	1050	950	1450	1350	2000	1100	1450	1500	2000	2200	2800	2200	2600	3100	3600	4500	5100
	20	400	650	500	850	750	1200	600	850	800	1200	1200	1650	1200	1500	1600	2000	2400	2900
	40	250	450	350	600	450	800	400	550	500	750	750	1100	800	1000	1100	1300	1500	1900

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C ABOVE 0°C (10% FOR EACH 20°F ABOVE 32°F)

CLIMB DATA

GROSS WEIGHT (IN LBS.)	TYPE OF CLIMB	3000 FT. ALT.				6000 FT. ALT.				9000 FT. ALT.				12000 FT. ALT.				RPM A	IN. HG			
		S.L. TO L.A.S.	BEST L.A.S.	TIME FROM S.L.	FT./MIN.	FUEL FROM S.L.	BEST L.A.S.	TIME FROM S.L.	FT./MIN.	FUEL FROM S.L.	BEST L.A.S.	TIME FROM S.L.	FT./MIN.	FUEL FROM S.L.	BEST L.A.S.	TIME FROM S.L.	FT./MIN.			FUEL FROM S.L.		
2470 DUAL	COMBAT FERRY	80	700	5	76	550	11	6.6	380	18	8.5	68	220	30	11							
	COMBAT FERRY	78	760	4.5	74	600	10		70	410	16	66	240	27								
	COMBAT FERRY																					

NOTE: INCREASE ELAPSED CLIMBING TIME 5% FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE (5% FOR EACH 20°F ABOVE 32°F) FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

LANDING DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	BEST I. A. S. Approach	HARD DRY SURFACE				FIRM DRY SOD				WET OR SLIPPERY									
		AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.						
		GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.		
2470 SOLO	80	1100	650	1150	700	1250	800	1350	900	1450	1000	1550	1100	2350	1900	2600	2100	2800	2300
	75	1000	550	1050	600	1100	650	1150	700	1200	750	1300	850	2050	1600	2200	1750	2400	1900

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL

REMARKS * FULL THROTTLE

LEGEND
I. A. S. Indicated Air Speed
NOTE: All distances are averages, and subject to considerable variations because of differences in pilot technique, wind, C.G., etc.
RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.

AIRPLANE MODELS		ENGINE MODELS			
PT-19A		L-40-1			
TAKE-OFF, CLIMB & LANDING CHART		6-440 C-2			
TAKE-OFF DISTANCE (IN FEET)					
GROSS WEIGHT (IN LBS.)	HEAD WIND (MPH)	HARD SURFACE RUNWAY		SOFT SURFACE RUNWAY	
		AT SEA LEVEL	AT 6,000 FT.	AT SEA LEVEL	AT 6,000 FT.
		TO CLEAR 50' OBL.	GROUND RUN	TO CLEAR 50' OBL.	GROUND RUN
2520	0	1200	1100	1700	1800
	20	450	750	700	1000
DUAL	0	300	400	450	600
	40	700	1050	1100	1450
2320	0	400	500	600	800
	20	250	350	400	550
SOLO	0	800	950	1000	1350
	40	400	500	550	750
		AT SEA LEVEL	AT 6,000 FT.	AT SEA LEVEL	AT 6,000 FT.
		GROUND RUN	TO CLEAR 50' OBL.	GROUND RUN	TO CLEAR 50' OBL.
		3600	4200	3600	4200
		3050	3600	3050	3600
		1750	2000	1750	2000
		900	1150	900	1150
		2600	3250	2600	3250
		1500	1900	1500	1900
		900	1250	900	1250
		2200	2800	2200	2800
		1200	1650	1200	1650
		800	1100	800	1100
		4500	5100	4500	5100
		2400	2900	2400	2900
		1500	1900	1500	1900

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C ABOVE 0°C (10% FOR EACH 20°F ABOVE 32°F)

CLIMB DATA

COMBAT MISSIONS USE	TYPE OF CLIMB	3000 FT. ALT.		6000 FT. ALT.		9000 FT. ALT.		12000 FT. ALT.	
		BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.
	COMBAT FERRY	80	5	72	380	68	220	30	11
	COMBAT FERRY	78	4.5	70	410	66	240	27	
	COMBAT FERRY								

NOTE: INCREASED ELAPSED CLIMBING TIME 5% FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE (5% FOR EACH 20°F ABOVE 32°F) FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

LANDING DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	BEST I.A.S. Approach	HARD DRY SURFACE		FIRM DRY SOD		WET OR SLIPPERY	
		AT SEA LEVEL	AT 6,000 FT.	AT SEA LEVEL	AT 6,000 FT.	AT SEA LEVEL	AT 6,000 FT.
		TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL	TO CLEAR 50' OBL.	GROUND ROLL
2520	80	1100	650	1350	900	2600	2100
	75	1000	550	1150	700	2200	1750
2320	80	1100	650	1350	900	2600	2100
	75	1000	550	1150	700	2200	1750

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL

REMARKS * FULL THROTTLE

LEGEND
I.A.S.: Indicated Air Speed
NOTE: All distances are average, and subject to considerable variation, because of differences in pilot technique, etc.
RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.

ENGINE MODELS
TAKE-OFF, CLIMB & LANDING CHART

AIRPLANE MODELS
P.T-19B

L-440-1

6-440 C-2

TAKE-OFF DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	HEAD WIND (MPH)	HARD SURFACE RUNWAY			SOFT SURFACE RUNWAY		
		AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.
		GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
2640 DUAL	0	800	1200	1650	1800	2350	2600
	20	450	750	1000	950	1400	1500
	40	300	500	650	600	900	1150
2440 SOLO	0	700	1050	1450	1500	2000	2200
	20	400	650	850	800	1200	1600
	40	250	450	550	500	750	1000

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C ABOVE 0°C (10% FOR EACH 20°F ABOVE 32°F)

CLIMB DATA

COMBAT MISSIONS USE	TYPE OF CLIMB	3000 FT. ALT.			6000 FT. ALT.			9000 FT. ALT.									
		BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.							
2640 DUAL	COMBAT FERRY	80	700	5	76	550	11	6.5	72	380	18	8.5	68	220	30	11	
2440 SOLO	COMBAT FERRY	78	760	4.5	74	600	10		70	410	16		66	240	27		
	COMBAT FERRY																

NOTE: INCREASED ELAPSED CLIMBING TIME 5% FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE 1.5% FOR EACH 20°F ABOVE 32°F FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

LANDING DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	BEST I.A.S. Approach	HARD DRY SURFACE			FIRM DRY SOD			WET OR SLIPPERY											
		AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.									
		GROUND RUN	TO CLEAR 50' OBJ.	GROUND ROLL	GROUND RUN	TO CLEAR 50' OBJ.	GROUND ROLL	GROUND RUN	TO CLEAR 50' OBJ.	GROUND ROLL									
2640	80	1100	650	1150	700	1250	800	1350	900	1450	1000	1550	1100	1900	2350	2600	2100	2800	2300
2440	75	1000	550	1050	600	1100	650	1150	700	1200	750	1300	850	1600	2050	2200	1750	2400	1900

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL.

REMARKS * FULL THROTTLE

LEGEND
I.A.S.: Indicated Air Speed
NOTE: All distances are average, and subject to considerable variation because of differences in pilot technique, load, C.G., etc.
RED FIGURES HAVE NOT BEEN NIGHT CHECKED.

AIRPLANE MODELS		ENGINE MODELS																	
PT-23		41-239																	
TAKE-OFF, CLIMB & LANDING CHART		TAKE-OFF DISTANCE (IN FEET)																	
GROSS WEIGHT (IN LBS.)	HEAD WIND (MPH)	HARD SURFACE RUNWAY			SOD-TURF RUNWAY			SOFT SURFACE RUNWAY			SOFT SURFACE RUNWAY								
		AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL	AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL	AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL	AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL						
2670	0	800	1200	1100	1650	1600	2250	1300	1700	1800	2350	2600	3250	2500	3050	3600	4200	5300	6000
DUAL	20	450	750	600	1000	850	1400	700	1000	950	1400	1400	1900	1500	1750	2000	2400	2900	3400
	40	300	500	400	650	550	950	450	650	600	900	900	1250	900	1150	1300	1600	1800	2200
2470	0	700	1050	950	1450	1350	2000	1100	1450	1500	2000	2200	2800	2200	2600	3100	3600	4500	5100
SOLO	20	400	650	500	850	750	1200	600	850	800	1200	1200	1650	1500	1800	2100	2400	2900	3400
	40	250	450	350	600	450	800	400	550	500	750	750	1100	800	1000	1100	1300	1500	1900

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C ABOVE 0°C (10% FOR EACH 20°F ABOVE 32°F)

CLIMB DATA

GROSS WEIGHT (IN LBS.)	TYPE OF CLIMB	3000 FT. ALT.			6000 FT. ALT.			9000 FT. ALT.			12000 FT. ALT.			FT. ALT.	BLOWER CHANGE				
		S.L. TO 3000 FT. ALT.	BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.						
2670	COMBAT FERRY	80	870	4	75	670	9	6.5	73	470	15	8	70	280	26				
DUAL	FERRY	SAME AS COMBAT (FULL THROTTLE RECOMMENDED DURING ALL CLIMBS)																	
2470	COMBAT FERRY	78	980	3.5	73	780	7	71	580	12.5	68	370	21						
SOLO	FERRY	SAME AS COMBAT (FULL THROTTLE RECOMMENDED DURING ALL CLIMBS)																	
	COMBAT FERRY																		

NOTE: INCREASED ELAPSED CLIMBING TIME 5% FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE (5% FOR EACH 20°F ABOVE 32°F)

LANDING DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	BEST I.A.S. Approach	HARD DRY SURFACE			FIRM DRY SOD			WET OR SLIPPERY											
		AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL	AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL	AT SEA LEVEL	TO CLEAR 50' OBJ.	GROUND ROLL									
2670	80	1100	750	1170	820	1250	900	1350	1000	1450	1100	1550	1200	2350	2000	2650	2300	2850	2500
2470	75	1000	650	1070	720	1150	800	1150	800	1250	900	1350	1000	1950	1600	2250	1900	2450	2100

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL.

REMARKS * FULL THROTTLE

LEGEND
I.A.S.: Indicated Air Speed
NOTE: All distances are average, and subject to wind, runway surface, and other conditions. Slight variations in wind, runway surface, and other conditions may cause a difference in actual performance. (C.G. and fuel weight figures have not been flight checked.)

AIRPLANE MODELS
ENGINE MODELS

P.T. - 26
L-440-3
6-440 C-5

TAKE-OFF, CLIMB & LANDING CHART

TAKE-OFF DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	HEAD WIND (MPH)	HARD SURFACE RUNWAY				SOD-TURF RUNWAY				SOFT SURFACE RUNWAY			
		AT 3,000 FT.		AT 6,000 FT.		AT 3,000 FT.		AT 6,000 FT.		AT 3,000 FT.		AT 6,000 FT.	
		GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
2710 DUAL	0	800	1200	1100	1650	1600	2250	1300	1700	1800	2350	2600	3250
	20	450	750	600	1000	850	1400	700	1000	950	1400	1400	1900
	40	300	500	400	650	550	950	450	600	600	900	900	1250
2510 SOLO	0	700	1050	950	1450	1350	2000	1100	1450	1500	2000	2200	2800
	20	400	650	500	850	750	1200	600	850	800	1200	1200	1650
	40	250	450	350	600	450	800	400	550	500	750	750	1100

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C ABOVE 0°C (10% FOR EACH 20°F ABOVE 32°F)

CLIMB DATA

GROSS WEIGHT (IN LBS.)	TYPE OF CLIMB	COMBAT MISSIONS USE				FERRY MISSIONS USE									
		AT 3,000 FT. ALT.		AT 6,000 FT. ALT.		AT 9,000 FT. ALT.		AT 12,000 FT. ALT.							
		S.L. TO 3,000 FT. ALT.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	TIME FROM S.L.	FUEL FROM S.L.	
2710 DUAL	COMBAT FERRY	82	640	5	78	540	11	6.6	75	440	18	8.2	71	340	26
	COMBAT FERRY	80	720	4.5	76	630	9	6.0	73	540	15	7.4	69	450	22
2510 SOLO	COMBAT FERRY														
	COMBAT FERRY														

NOTE: INCREASED ELAPSED CLIMBING TIMES 5% FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE (5% FOR EACH 20°F ABOVE 32°F) FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

LANDING DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	BEST I.A.S. Approach	HARD DRY SURFACE				FIRM DRY SOD				WET OR SLIPPERY			
		AT 3,000 FT.		AT 6,000 FT.		AT 3,000 FT.		AT 6,000 FT.		AT 3,000 FT.		AT 6,000 FT.	
		GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
2710	80	1100	1170	820	1250	900	1350	1000	1450	1100	1550	1200	2350
	77	1000	650	1070	720	1150	800	1150	800	1250	900	1350	1000
2510	80	1100	1170	820	1250	900	1350	1000	1450	1100	1550	1200	2350
	77	1000	650	1070	720	1150	800	1150	800	1250	900	1350	1000

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL.

REMARKS * FULL THROTTLE

LEGEND
I.A.S.: Indicated Air Speed
NOTE: All distances are conservative and subject to considerable variations because of differences in pilot technique, load, C.G., etc.
RED FIGURES HAVE NOT BEEN THOROUGHLY CHECKED.

MODEL (S) PT-19		FLIGHT OPERATION INSTRUCTION CHART SHEET.....OF.....SHEETS				EXTERNAL LOAD ITEMS NONE			
		GR. WT. 2200				POUNDSTO...2470			
CONDITION	R.P.M.	M.P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	DURATION IN MIN.	U.S. G.P.H.	IMP. G.P.H.		
TAKE-OFF									
MILITARY POWER									
ENGINE (S)									
INSTRUCTIONS FOR USING CHART: Select figure in fuel column equal to or less than total amount of fuel in airplane. Move horizontally to the right or left and select a figure equal to or greater than the air miles to be flown. Vertically below and opposite desired cruising altitude read optimum cruising conditions. NOTES: (A) Avoid continuous cruising in Column I in the upper left corner of chart.									
ALTERNATE CRUISING CONDITIONS (NO WIND)									
I (MAX. CONT. POWER)									
RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES	
STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL
250	215	300	260	360	315	400	345	400	345
185	155	225	195	270	230	300	255	300	255
125	105	150	130	180	155	200	170	200	170
60	50	75	65	90	75	100	85	100	85
FUEL U.S. GALS.		FUEL U.S. GALS.		FUEL U.S. GALS.		FUEL U.S. GALS.		FUEL U.S. GALS.	
40		30		20		10		8	
ALTERNATE CRUISING CONDITIONS (NO RESERVE FUEL ALLOWANCE)									
RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES	
STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL
2435	125	109	18	15	6000	1905	88	77	8
2350	117	102	16	13	3000	1820	82	72	8
2260	113	98	16	13	S.L.	1730	75	66	7
OPERATING DATA		OPERATING DATA		OPERATING DATA		OPERATING DATA		OPERATING DATA	
R.P.M.	I.A.S. M.P.H.	I.A.S. M.P.H.	M.P. IN. HG.	I.A.S. M.P.H.	M.P. IN. HG.	I.A.S. M.P.H.	M.P. IN. HG.	I.A.S. M.P.H.	M.P. IN. HG.
	2380	118	103	2135	104	90	10	2000	93
	2290	114	99	2045	100	87	10	1905	88
	2205	109	95	1965	95	83	10	1820	82
	2110	105	91	1865	82	71	8	1730	75
DENSITY ALT. IN FEET		DENSITY ALT. IN FEET		DENSITY ALT. IN FEET		DENSITY ALT. IN FEET		DENSITY ALT. IN FEET	
30000		25000		20000		15000		12000	
9000		6000		3000		S.L.			

NOTES: (1) INDICATED ALTITUDE CORRECTED FOR FREE AIR TEMPERATURE. (2) ALLOW 3 U.S. GALS. TAKE-OFF AND CLIMB TO RETURN FUEL FLOWS TO TANK. USE FUEL FROM TANKS IN THE FOLLOWING ORDER: REFER TO "SPECIFIC ENGINE FLIGHT CHART" FOR ADDITIONAL ENGINE OPERATION DATA.

BOLD NUMBERS: Use Auto-Rev. LIGHT NUMBERS: Use Auto-Lean WITH TWO SPEED BLOWER. Use high blower above heavy line only.

UNIT CONVERSIONS: I.A.S.: Indicated Air Speed M.P.H.: Manifold Pressure (In. Hg.) U.S.G.P.H.: U.S. Gallons Per Hour IMP.G.P.H.: Imperial Gallons Per Hour P.T.: Full Thrust

ENGINEER'S NOTE: AAF Inspectors at modification centers will strike out columns not meeting criteria. Note of instruments in the airplane at time of delivery.

MODEL (S) P.T.-26		FLIGHT OPERATION INSTRUCTION CHART				EXTERNAL LOAD ITEMS			
SHEET OF SHEETS		GR. WT. 2440 TO 2710 POUNDS				NONE			
CONDITION	R.P.M.	M.P.H. (IND. HD)	BLOWER POSITION	MIXTURE POSITION	DURATION IN MIN.	U.S. G.P.H.	IMP. G.P.H.		
TAKE-OFF									
MILITARY POWER									
ENGINE (S)									
INSTRUCTIONS FOR USING CHART: Select figure in fuel column equal to or less than total amount of fuel in airplanes. Move horizontally to the right or left and select a figure equal to or greater than the air miles to be flown. Vertically below and opposite desired cruising altitude read optimum cruising conditions. NOTES: (A) Avoid continuous cruising in Column I in the upper left corner of chart.									
ALTERNATE CRUISING CONDITIONS									
(NO WIND)									
(NO RESERVE FUEL ALLOWANCE)									
I (MAX. CONT. POWER)		II		III		IV		V (MAX. RANGE)	
RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES	
STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL
200	170	240	205	300	260	360	310	390	335
150	125	80	150	225	195	195	230	290	245
100	85	120	100	150	130	130	155	175	165
50	40	60	50	75	65	65	75	95	80
FUEL U.S. GALS. ③		FUEL U.S. GALS. ③		FUEL U.S. GALS. ③		FUEL U.S. GALS. ③		FUEL U.S. GALS. ③	
40	30	20	10	33	25	17	8	33	25
OPERATING DATA		OPERATING DATA		OPERATING DATA		OPERATING DATA		OPERATING DATA	
R.P.M.	I.A.S. M.P.H. KNOTS IN. HG	R.P.M.	I.A.S. M.P.H. KNOTS IN. HG	R.P.M.	I.A.S. M.P.H. KNOTS IN. HG	R.P.M.	I.A.S. M.P.H. KNOTS IN. HG	R.P.M.	I.A.S. M.P.H. KNOTS IN. HG
2450	126 109	2450	127 110	2450	127 110	2400	124 107.5	2150	106.5 92.5
30000	—	30000	—	30000	—	30000	—	30000	—
25000	—	25000	—	25000	—	25000	—	25000	—
15000	—	15000	—	15000	—	15000	—	15000	—
12000	—	12000	—	12000	—	12000	—	12000	—
9000	—	9000	—	9000	—	9000	—	9000	—
6000	—	6000	—	6000	—	6000	—	6000	—
3000	—	3000	—	3000	—	3000	—	3000	—
S.L.	21 17.5	S.L.	2400 124 107.5	S.L.	2400 124 107.5	S.L.	2050 106.5 92.5	S.L.	—
DENSITY ALT. IN FEET		DENSITY ALT. IN FEET		DENSITY ALT. IN FEET		DENSITY ALT. IN FEET		DENSITY ALT. IN FEET	
30000	—	30000	—	30000	—	30000	—	30000	—
25000	—	25000	—	25000	—	25000	—	25000	—
20000	—	20000	—	20000	—	20000	—	20000	—
15000	—	15000	—	15000	—	15000	—	15000	—
12000	—	12000	—	12000	—	12000	—	12000	—
9000	—	9000	—	9000	—	9000	—	9000	—
6000	—	6000	—	6000	—	6000	—	6000	—
3000	—	3000	—	3000	—	3000	—	3000	—
S.L.	—	S.L.	—	S.L.	—	S.L.	—	S.L.	—

EDITOR'S NOTE: AAF inspectors at modification centers will strike out columns not matching calibration of instruments in the airplane at time of delivery.

I.A.S.: Indicated Air Speed
M.P.H.: Manifold Pressure
U.S.G.P.H.: U. S. Gallons Per Hour
IMP.G.P.H.: Imperial Gallons Per Hour
R.T.: Full Thrust

BOLD NUMBERS: Use Auto-Rich
LIGHT NUMBERS: Use Auto-Lean
WITH TWO SPEED BLOWER: Use high blower above heavy line only

① INDICATED ALTITUDE CORRECTED FOR FREE AIR TEMPERATURE
② ALLOW 3.5 U. S. GALS. IMP. GALS. FOR WARM UP, TAKE-OFF AND CLIMB TO _____ FEET ALTITUDE
RETURN FUEL FLOWS TO TANK
USE FUEL FROM TANKS IN THE FOLLOWING ORDER
REFER TO "SPECIFIC ENGINE FLIGHT CHART" FOR ADDITIONAL ENGINE OPERATION DATA.

RED FIGURES ARE PRELIMINARY: SUBJECT TO REVISION AFTER FLIGHT CHECK

APPENDIX IGLOSSARY OF TERMS

<u>American</u>	<u>British</u>
Airplane	Aeroplane
Battery	Accumulator
Carburetor	Carburettor
Empennage	Tail Unit
Engine or Power Plant	Aero Engine
Fairchild PT-19, PT-19A, PT-19B, PT-23, PT-26	Cornell
Fuel Gage	Fuel Contents Gauge
Gas	Petrol or Fuel
Generator	Dynamo
Inverter	Motor Generator
Landing Gear	Alighting Gear
Lean	Weak
Left	Port
Outer Panel	Outer Plane
Pitot	Pressure Head
Right	Starboard
Trim Tab	Trimming Tab
Vent	Vent Pipe
Wing	Main Plane

APPENDIX II
EMERGENCY INSTRUCTIONS

1. ENGINE FAILURE IN FLIGHT.

- a. Drop the nose and maintain a gliding speed of 80 mph.
- b. Open cockpit enclosure (PT-26 ONLY).
- c. Ignition switch "OFF."
- d. Make a normal landing if possible.
- e. Master switch "OFF" (PT-19B, PT-23, and PT-26 ONLY).

2. FIRE.

- a. PT-26 ONLY. -Do not use the fire extinguisher for fires in flight within the cockpit without first opening the enclosure.

b. The fire extinguisher door in the forward left fuselage cowl gives easy access to the fire extinguisher mounted on the front portion of the front cockpit. If you are not in the airplane when fire breaks out, with the ship on the ground, use this door to reach the extinguisher.

3. NOSE-OVER.

The turn-over structure on top of the fuselage between the cockpits protects the occupants in the event of nose-over. If the ship should nose over, let yourself down easily with the safety belt or harness. In the PT-26, open the enclosure before landing.

4. FUEL PUMP FAILURE.

Use the hand wobble pump and maintain 3- to 4-pound pressure, 2 to 3 pounds on the PT-23.

APPENDIX III
EXTREME WEATHER NOTES

1. EXTREME COLD.

a. Always use oil dilution before stopping engine (PT-19B, PT-23, and PT-26 ONLY).

b. The use of an electric oil immersion heater is recommended to facilitate starting regardless of whether the airplane is equipped for oil dilution or not.

c. STARTING.

(1) Use 3 or 4 shots of primer and 5 or 6 sharp strokes of throttle, 5 or 6 shots of primer only on PT-23.

(2) Pump throttle rapidly near "CLOSED" position immediately after engine starts to keep it going. (Not applicable to PT-23.)

(3) Extend warm-up time as long as necessary to assure satisfactory operating before preparing to take off.

d. CARE OF CONTROLS.

(1) Keep all controls free from freezing and sticking.

(2) Lubrication of controls with very light machine oil will help keep them in satisfactory operating condition. Do not lubricate ball bearings.

e. "Lagging" the oil tank and oil lines with asbestos will help in maintaining satisfactory operating temperatures. This is done by securely wiring sheets of asbestos to the exposed portions of the tank and lines.

f. Remove all snow, ice, sleet, or slush from every part of the airplane before attempting to take off. Make sure airplane is completely dry and that no moisture remains as this would freeze in flight. Dry snow may be brushed or blown off. Sleet and ice should be very gradually melted off, preferably by the sun or by plac-

ing the airplane in a heated hangar and letting it "thaw out" by itself.

g. Icing conditions occur when flying through rain or clouds when the temperature is approximately freezing or colder. At very cold temperatures or at high altitudes icing is rarely encountered. Do not fly through regions where icing conditions are suspected unless absolutely necessary. If, for some reason, this must be done, watch the leading edges of the wing and tail closely for evidence of ice. Glaze, or clear ice, is the most difficult type to detect. If ice begins to form, land as soon as possible or descend to a lower altitude where the temperature is well above freezing. If there is ice on the wings or tail, land the airplane at somewhat above normal landing speed in order to prevent stalling and to maintain control.

h. Mooring is sometimes facilitated in cold weather by tying the mooring line around the middle of a large stick or 2 x 4 about 3 feet long and placing it in a hole in the ground about 2 to 3 feet deep. The hole may then be filled with water which will freeze, holding the ship secure. Temperature must be well below freezing if this method is used. Engine and wing covers are recommended to protect the airplane in extreme cold when mooring a ship out-of-doors.

2. EXTREME HEAT.

a. AIR FILTER.

(1) The only necessary precaution in very hot weather is to inspect the Air Maze filter by removing the screen from the carburetor air intake duct every 7 to 10 hours. Dust and insects might accumulate there to such an extent that satisfactory engine operation might be hampered. The screen may be cleaned by an air pressure hose and nonleaded gasoline.