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FLIGHT HANDBOOK

USAF SERIES

L-16A AND L-16B

AIRCRAFT

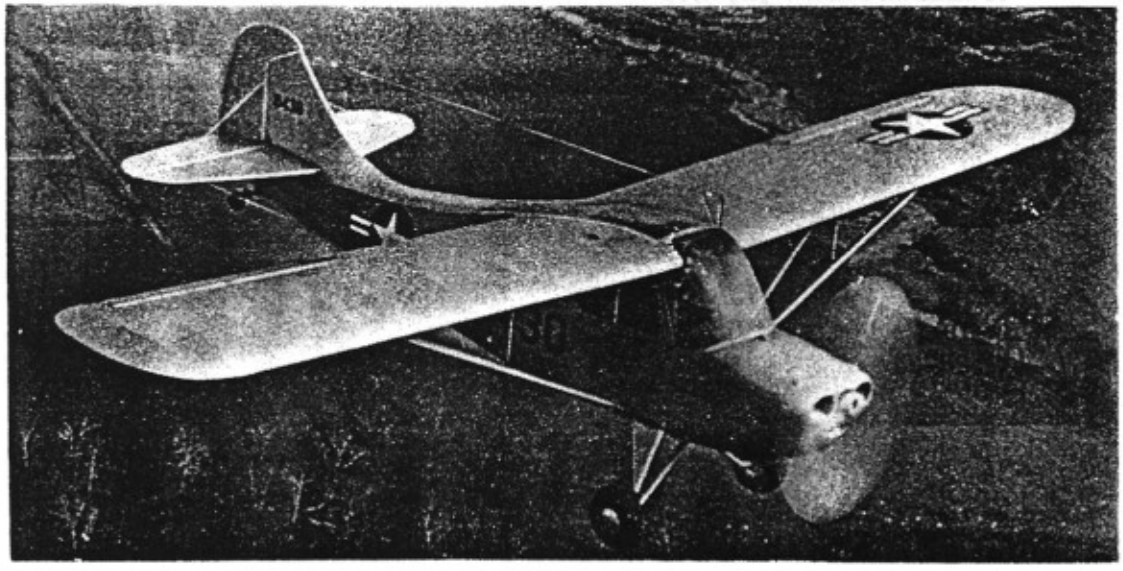

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TABLE OF CONTENTS

ILLUSTRATIONS

IMPORTANT

In order to gain the maximum benefit from this handbook, it is imperative that you read these pages carefully.

This handbook contains all the information necessary for safe and efficient operation of the L-16A and B series airplanes. These instructions do not teach basic flight principles, but are designed to provide you with a general knowledge of the airplane, its flight characteristics, and specific normal and emergency operating procedures. Your flying experience is recognized, and elementary instructions have been avoided.

The only source of technically accurate and constantly current information is contained in your Flight Handbook. This information is based upon the technical knowledge of the aircraft manufacturer and the Air Force as well as the experience of the using commands. You would never recognize these new books as your old familiar, undesirable -1 technical order. To help solve your specific problems, these new books have been made attractive, accurate, current, and easy to use. Not all of the books have been prepared to the new requirements, but you can easily tell the old from the new. The new type handbook has a full page cover illustration whereas the old book has a small "spot" illustration.

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Your comments and questions regarding any phase of the Flight Handbook program are invited and should be directed to the Wright Air Development Center, Attention: WCOSF-3.

This handbook is divided into sections as follows:

Section I, Description of Airplane. The function of this section is to describe the airplane, its equipment, systems, and controls which are essential to flight and which will be needed for one complete non-combat mission.

Section II, Normal Operating Instructions. This section contains the steps of procedure to be accomplished from the time the aircraft is approached by the flight crew until it is left parked on the ramp after accomplishing one complete non-combat mission. This section also includes a discussion of the normal flight characteristics of the airplane.

Section III, Emergency Operating Instructions. This section clearly and concisely describes the procedure to be followed in meeting the emergency of fire and engine failure.

Section IV, Operational Equipment. This section includes the description, normal operation and emergency operation of all equipment not directly contributing to flight but which enables the airplane to perform certain specialized functions. Included in this category are such items as: heating system, ventilating system, and communications equipment.

Section V, Extreme Weather Operations. Information concerning operation of this aircraft in cold and hot weather is contained in this section.

Appendix I, Operating Charts. The appendix contains all operating data necessary for pre-flight and in-flight mission planning and the instruments markings for operational limitations.

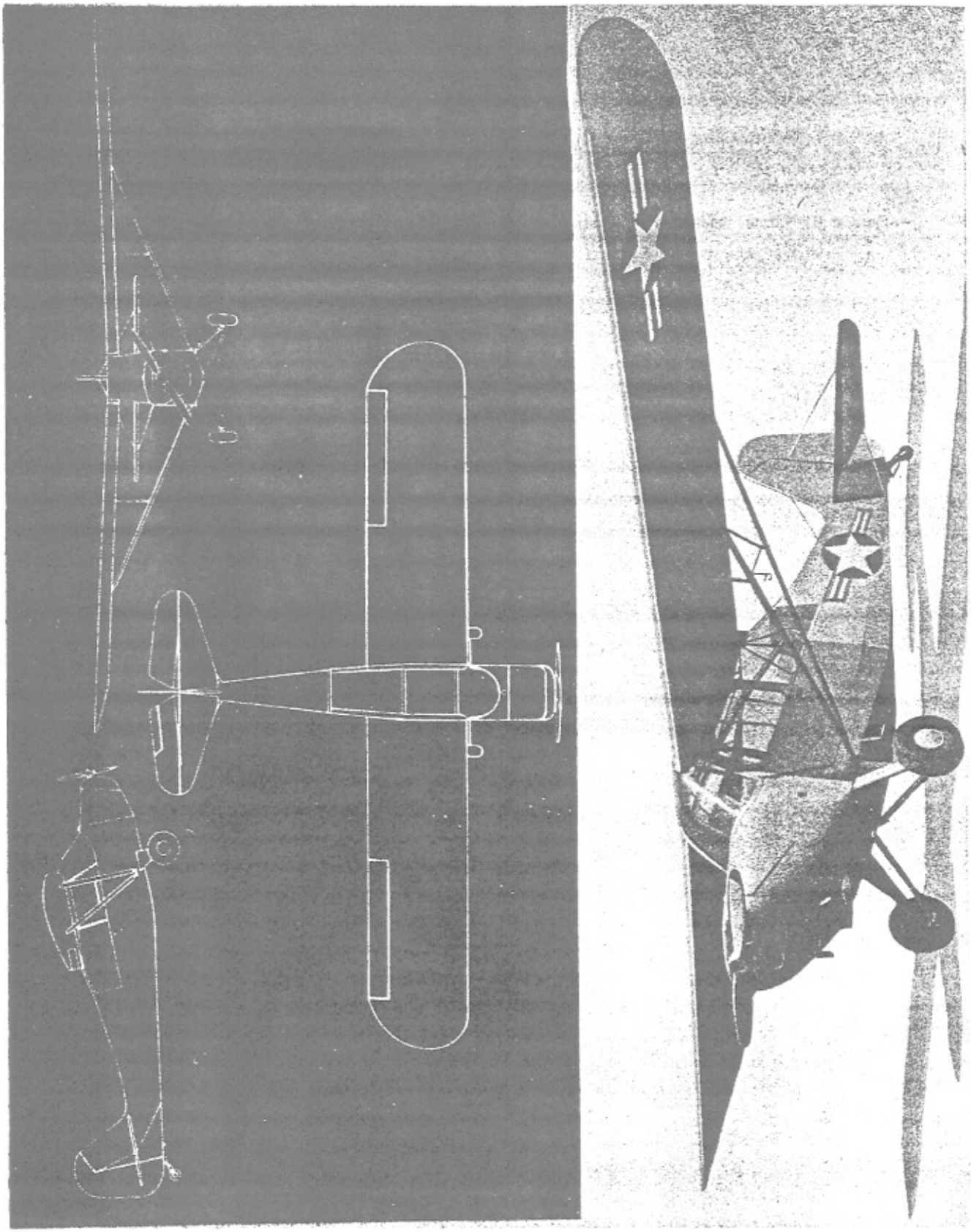
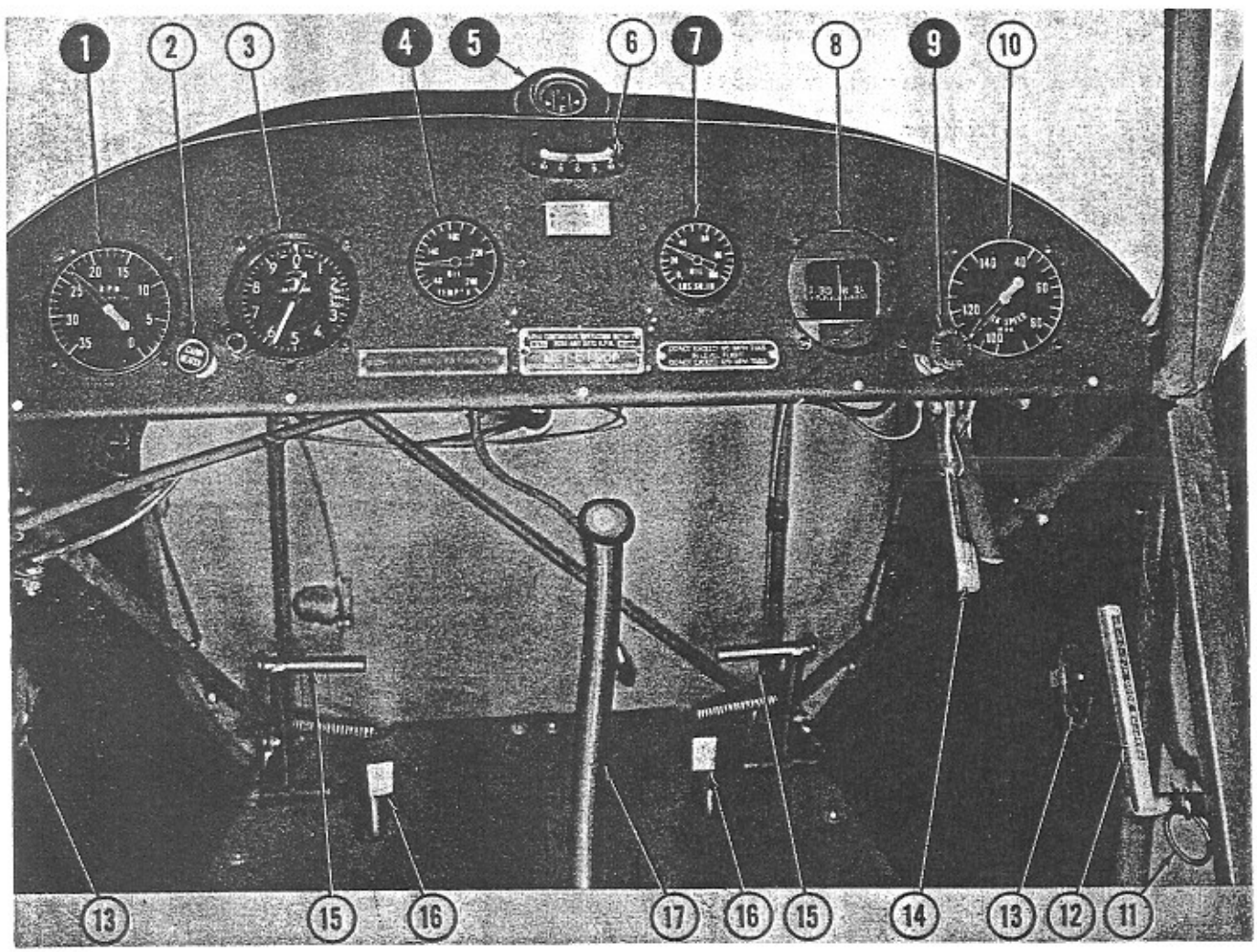


Figure 1-1. Three-Quarter View—Airplane.

SECTION I
DESCRIPTION

1-1. AIRPLANE.

1-2. GENERAL. The Aeronca airplane, Model L-16A is a high wing monoplane with tandem seating arrangement and dual controls. It is powered by a four cylinder, horizontally opposed, air-cooled Continental engine, Model O-190-1. The engine turns a two bladed, metal, fixed pitch McCauley propeller. The landing gear is a fixed tripod type employing mechanical brakes. A steerable tail wheel is mounted on leaf springs and is connected to the rudder control. The Model L-16B airplane has hydraulic brakes, radio receiver-transmitter and an auxiliary fuel tank installed in the right wing. The Model L-16B is powered by a Continental engine, Model O-205-1.



1. Tachometer
2. Cabin Heater Control
3. Altimeter
4. Oil Temperature Gage
5. Fuel Gage
6. Ball Bank Indicator
7. Oil Pressure Gage
8. Compass
9. Primer
10. Air Speed Indicator
11. Door Release Pin Ring
12. Emergency Door Release Handle
13. Air Ventilator
14. Parking Brake Handle
15. Rudder Pedal
16. Brake Pedal
17. Control Stick

Figure 1-2. Pilot's Compartment, Forward View

1-3. AIRPLANE SIZE.

Wing Span	35 feet, 2 inches
Overall Length	21 feet, 6 inches
Height (level)	8 feet, 8 inches

1-4. GROSS WEIGHT. The maximum allowable gross weight for the airplane is 1300 pounds. The overload gross weight 1350 pounds.

1-5. CONTROLS.

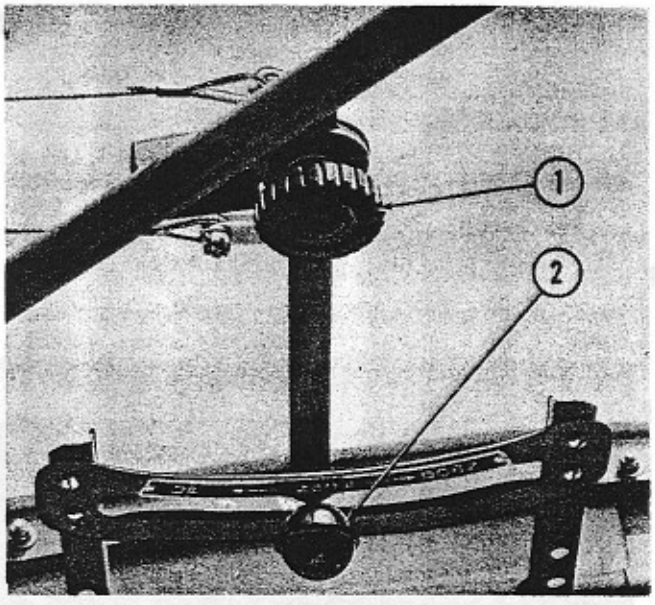
1-6. FLIGHT CONTROLS.

1-7. ELEVATOR & AILERONS. A conventional stick is employed to operate the elevator and ailerons.

1-8. RUDDER. Rudder pedals (figure 1-2) of the conventional type are installed for rudder operation. The tail wheel is also operated thru the rudder pedals.

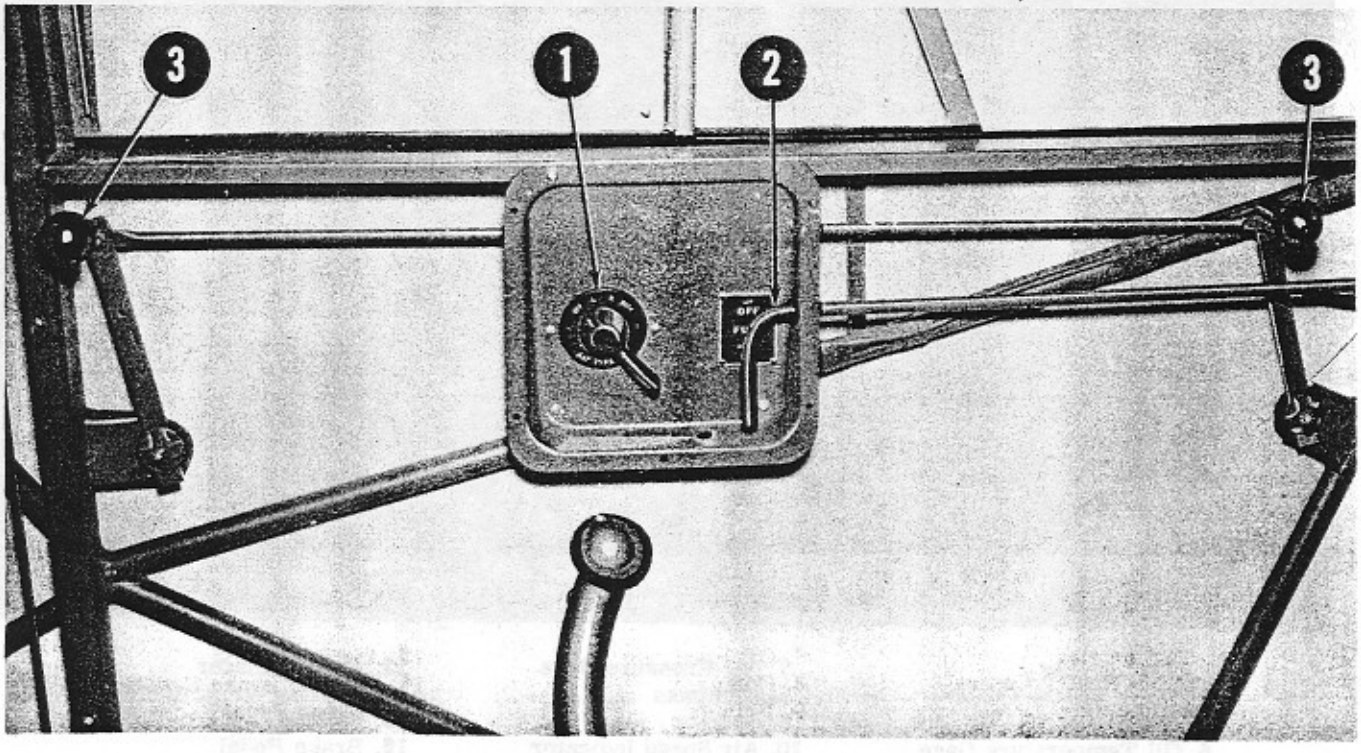
1-9. TRIM TAB. The elevator trim tab control (figure 1-3) is located on the cabin roof, slightly behind and to the left of the front seat, and the tab is actuated by moving the control knob forward (nose down trim) or aft (nose up trim). A friction lock (figure 1-3) operated by turning an adjusting knob, will provide any desired friction on the tab control system, or securely lock the tab for any desired trim condition.

1-10. CONTROL LOCK. No mechanical lock is provided for the surface controls. The elevator and ailerons may be secured by lashing the rear seat control stick in its most forward position with the front seat safety belt. Rudder lock is provided by the rudder-tail wheel spring connectors which will lock the rudder in one position to the limit of the spring tension.



1. Friction Lock
2. Elevator Trim Control

Figure 1-3. Elevator Trim Tab Control



1. Ignition Switch
2. Fuel Shut-Off Valve
3. Throttle

Figure 1-4. Pilots Compartment, Left Side

1-11. POWER PLANT CONTROLS.

1-12. THROTTLE. (figure 1-4) Engine throttle controls are mounted on the left side of cabin. A separate control is available for both crew members, the two quadrants being linked by a control rod.

1-13. PRIMER. (figure 1-2) The engine primer is mounted on the right side of the instrument panel and is available only to the crew member in the forward seat. It is a conventional hand operated pump type.

1-14. IGNITION SWITCH. (figure 1-4) The ignition or magneto switch is on the left side of the cabin directly opposite the front seat back and is within easy reach of both crew members.

1-15. CARBURETOR HEAT. The engine is a fuel injector type and hence no carburetor heat is required.

1-16. STARTER. There is no mechanical starter provided. The engine must be turned over by swinging the propeller by hand.

1-16A. FUEL AND OIL SPECIFICATIONS.

1-16B. FUEL. The recommended fuel for this airplane shall be in accordance with specification No. MIL-F-5572, Grade 80. The alternate fuel shall be in accordance with U. S. Army Specification No. 2-103, Grade 80.

1-16C. OIL. Oil to be used in this airplane shall be in accordance with Specification No. MIL-L-6082A, Grade 1065 for winter and 1100 for summer.

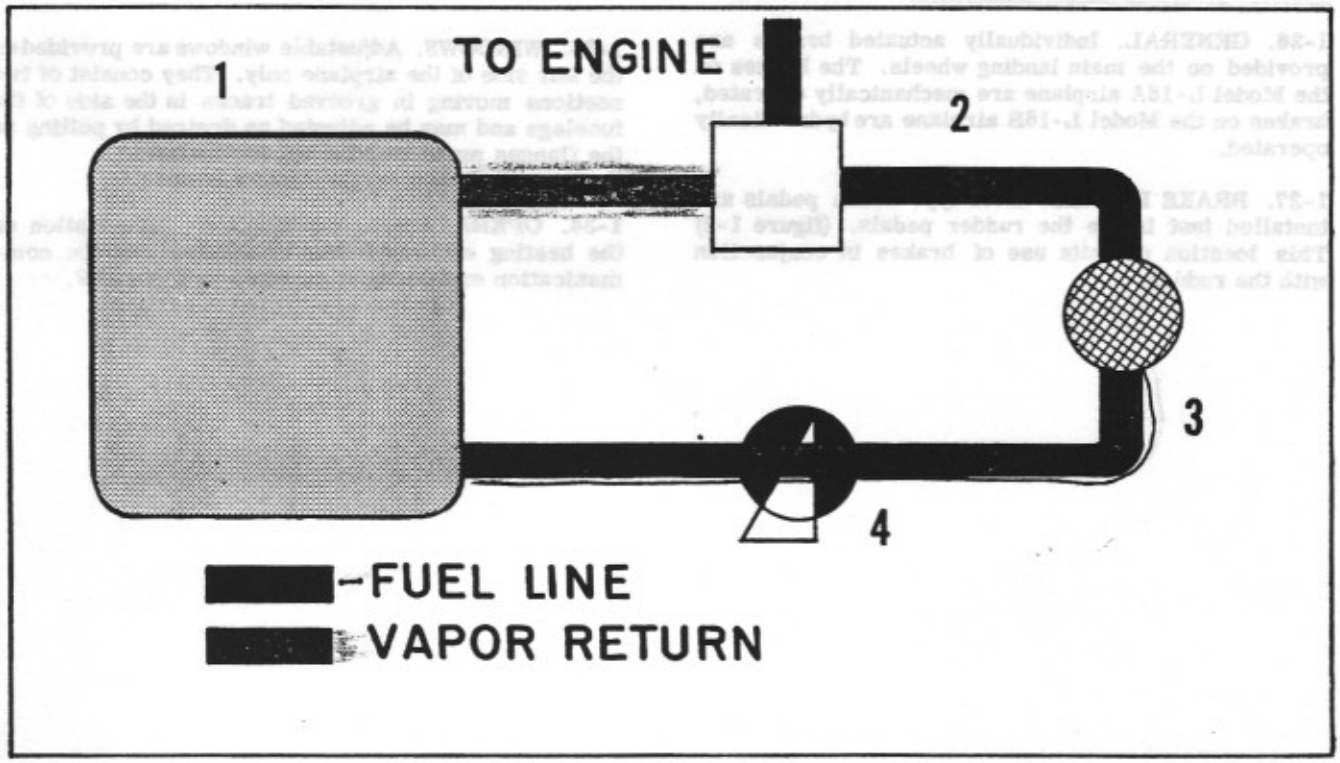
1-17. FUEL SYSTEM.

1-18. GENERAL. The fuel system is a combination gravity and forced flow type. The gravity flow is supplemented by the fuel injector pump which draws fuel from the main tank in quantities exceeding the required engine supply. The excess fuel is pumped back into the main tank through a return line (figure 1-5). On the Model L-16B, an auxiliary tank supplements the main fuel supply. Fuel from this tank drains into the main tank by gravity feed. (figure 1-6).

1-19. FUEL TANK (Main). The main fuel supply is carried in a tank located just aft of the firewall. The tank capacity is 13.0 U. S. gallons. This is the only fuel tank on the Model L-16A airplane.

1-20. FUEL TANK (Auxiliary). The Model L-16B airplane carries an auxiliary fuel supply in a tank located in the right wing panel. The tank capacity is 6.0 U. S. gallons with a usable capacity of 5.5 U. S. gallons.

1-21. FUEL GAGE. (Main Tank). A float type fuel gage is mounted on top of the tank and extends through the cowl forward of the instrument panel. The gage can be read from either seat. (figure 1-2).



1. Gas Tank
2. Injector Pump
3. Fuel Sediment Bowl
4. Shut-Off Valve

Figure 1-5. Fuel System Diagram, Model L-16A.

1-22. FUEL GAGE. (Auxiliary Tank). A float type fuel gage is mounted in the side of the auxiliary tank. The gage is visible through a cut-out in the fabric covering the right wing root, above the door.

1-23. FUEL VALVE (Main Tank). The fuel shut-off valve is operated by a control located on the left side of the pilots compartment opposite the back of the front seat. The same control is available to both occupants. (figure 1-4). Turning the fuel control handle full down turns on the fuel, full up shuts off the flow of fuel.

1-24. FUEL VALVE (Auxiliary Tank). The fuel shut-off valve for the auxiliary tank is located above the door inside the pilots compartment. The valve is only available to the pilot in the front seat. Turning the handle to a horizontal position turns the fuel "on", turning the handle to a vertical position shuts the fuel "off".

NOTE.

Drain the fuel contents from the auxiliary tank when main tank is half full. Compliance will prevent main tank from overflowing.

NOTE.

Auxiliary fuel should be drained into main tank only when airplane is in level flight.

1-25. BRAKE SYSTEM CONTROLS.

1-26. GENERAL. Individually actuated brakes are provided on the main landing wheels. The brakes on the Model L-16A airplane are mechanically operated, brakes on the Model L-16B airplane are hydraulically operated.

1-27. BRAKE PEDALS. Heel type brake pedals are installed just inside the rudder pedals. (figure 1-2) This location permits use of brakes in conjunction with the rudder.

1-28. PARKING BRAKE. A hand operated parking brake control is located under the right side of the instrument panel (figure 1-2).. Pulling back on the handle sets the brakes. The control is locked in position by a ratchet which can be released by squeezing the trigger type handle. In setting the parking brakes, it is advisable to operate the brake pedals at the same time, thus relieving the load on the parking brake cable.

1-29. ELECTRICAL SYSTEM. No electrical system is provided with the airplane, although it is wired internally for installation of position lights.

1-30. MISCELLANEOUS EQUIPMENT.

1-31. SEATS. The seats are provided with seat and back cushions (figure 1-6). The seat cushions may be removed in the event seat pack parachutes are used. Each seat is equipped with an adjustable safety belt. Neither seat is adjustable.

1-32. DOOR. The airplane is equipped with a door on the right side, hinged at front, and opening with a conventional door handle. A map compartment is located in the door panel. The door may be jettisoned at any time by an emergency release mechanism which releases the hinges. The emergency door release handle is located just forward of the door hinge line. (figure 1-2) Refer to Section III, Emergency Operating Instructions, for instructions in releasing the door.

1-33. WINDOWS. Adjustable windows are provided on the left side of the airplane only. They consist of two sections moving in grooved tracks in the side of the fuselage and may be adjusted as desired by pulling on the flanges making up the window frames.

1-34. OPERATIONAL EQUIPMENT. Information on the heating and ventilating equipment and the communication equipment is supplied in Section IV.

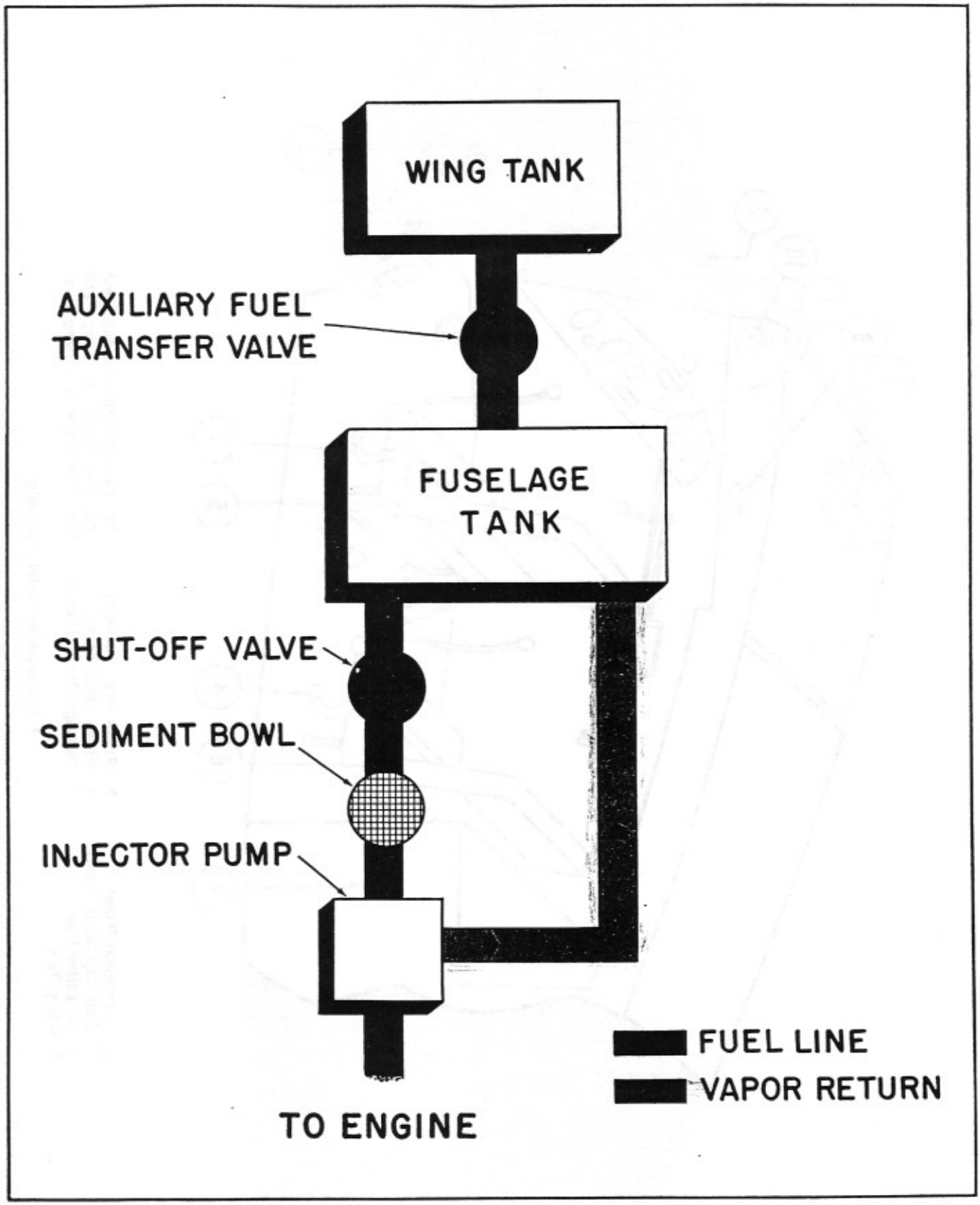
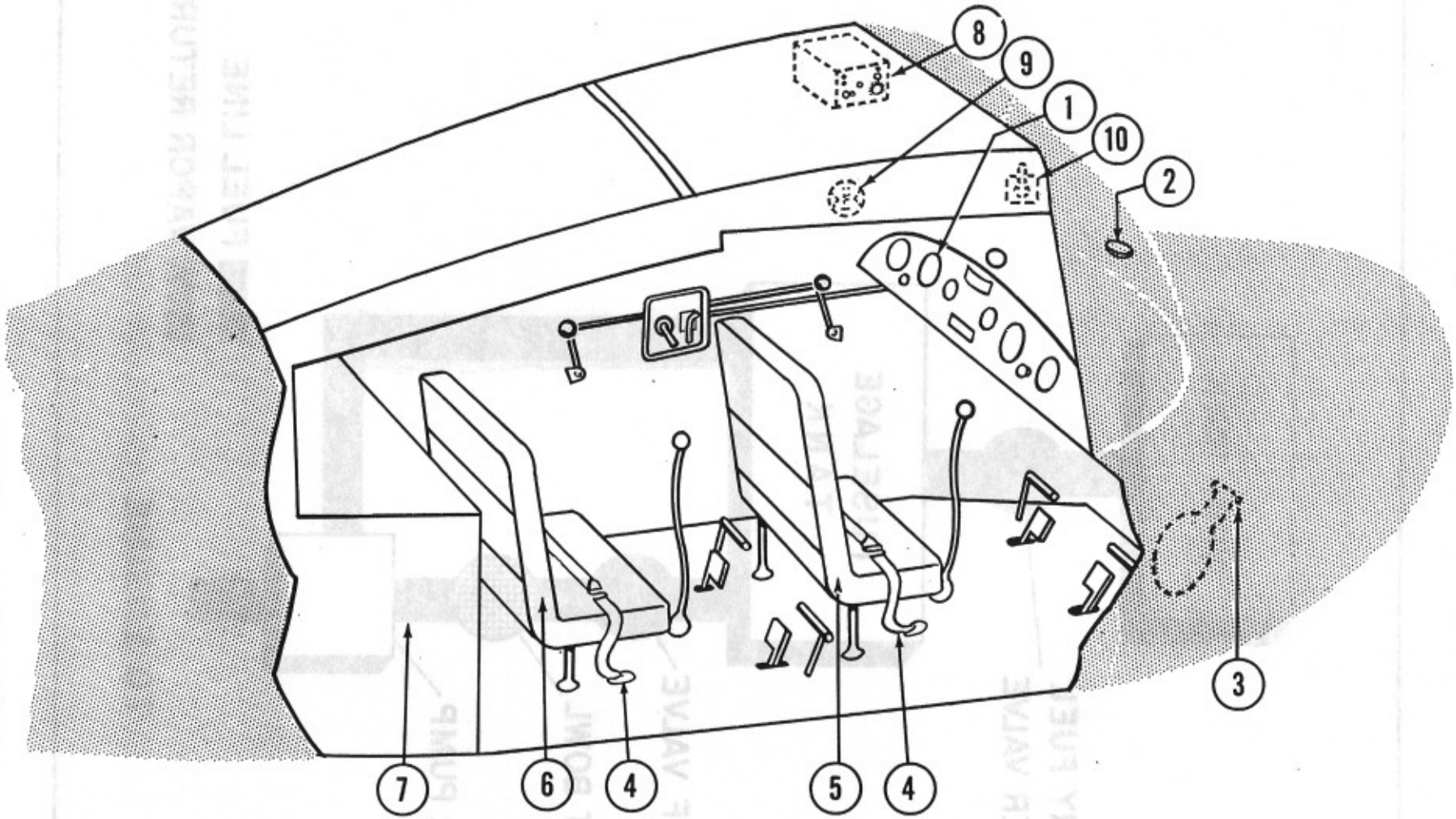


Figure 1-6. Fuel System Diagram, Model L-16B.



1. Instrument Panel
2. Fuel Cap (Main Tank)
3. Oil Filler Cap
4. Safety Belt
5. Pilots Seat, Forward
6. Pilots Seat, Rear
7. Baggage Compartment
*8. Communication Equipment
*9. Fuel Valve, Auxiliary Tank
*10. Fuel Gage, Auxiliary Tank

* Available to Model-16B only

Figure 1-7. General Arrangement Diagram

SECTION II

NORMAL OPERATING INSTRUCTIONS

2-1. BEFORE ENTERING THE PILOTS COMPARTMENT

2-2. FLIGHT LIMITATIONS AND RESTRICTIONS

a. The following maneuvers are prohibited.

(1) Inverted Flight.

(2) Outside Loop.

(3) Inverted Spin.

(4) Snap or slow rolls at speeds in excess of 85 mph.

(5) Intentional spinning when baggage is carried.

b. Maximum engine speed.

(1) Model L-16A - 2575 rpm.

(2) Model L-16B - 2475 rpm.

c. When flying the Model L-16A airplane avoid continuous engine operation between 2030 and 2270 rpm. Propeller tip vibration occurs within this speed range.

d. Do not exceed 95 mph IAS in level flight.

e. Do not exceed 129 mph IAS at any time.

These limitations and restrictions are subject to change and latest service directives and orders must be consulted.

2-2A. MINIMUM CREW REQUIREMENTS. The minimum crew requirement for this airplane is one pilot in the front seat. Additional crew members as required will be added at the discretion of the Commanding Officer.

2-3. WEIGHT AND BALANCE. The subject airplane is classed as a "light aircraft" and hence weight and balance problems are greatly simplified. The number of crew members presents the largest variation in the balance of the airplane and a placard on the instrument panel instructs the pilot to fly solo from front seat only.

2-4. EXTERIOR CHECK.

a. Check Form 1.

b. Check fabric on wings, fuselage and tail for holes, tears, or wrinkles.

c. Inspect tires for proper inflation.

d. Check wing strut nuts and bolts.

e. Examine tail wheel.

f. Inspect tail surface brace wires.

g. Examine propeller for nicks or cracks.

h. Check engine cowl openings for any foreign articles.

i. Remove pitot-static tube cover.

j. Make a general exterior inspection of the airplane.

2-5. ON ENTERING PILOTS COMPARTMENT.

2-6. CHECK FOR ALL FLIGHTS.

a. Ignition switch—"OFF".

b. Fuel quantity—Check.

c. Fuel Valve (Main)—"ON".

d. Fuel Valve (Aux.)—"OFF" (Model L-16B only)

e. Brakes—Check.

f. Flight controls—Check for free and correct movement.

g. Trim tab neutral.

h. Check floor for any foreign articles.

i. Fasten safety belt and determine other crew member has fastened belt. If flying solo, determine that unused belt is fastened across seat.

2-7. STARTING ENGINE.

2-8. STARTING COLD ENGINE.

a. Prime—three to five strokes.

b. Throttle—open.

c. Turn engine—three or four revolutions.

d. Throttle—closed.

e. Turn engine—two additional revolutions.

NOTE

There is no mechanical starter and turning the propeller must be done by hand by a member of the ground crew.

f. Ignition switch—"ON".

g. Control Stick—back.

h. Throttle—open slightly.

i. Turn engine. It should start within three or four revolutions.

j. If engine fails to start the cause may be in over-priming or insufficient priming. If the engine is over-primed it will generally fire weakly on one or two cylinders and emit black exhaust smoke. To remedy this condition, turn engine backward through several revolutions with the ignition switch "OFF" and the throttle open.

2-9. STARTING WARM ENGINE.

a. Prime—two or three strokes.

NOTE

Priming the engine when warm may seem contrary to normal practice. However, the engine is equipped with an injector type fuel system which requires a certain amount of priming before every start.

b. Throttle—open slightly.

c. Ignition switch—"ON".

d. Turn engine.

e. If engine fails to start, proceed as in paragraph 2-8j.

2-10. ENGINE WARM-UP.

a. Idle engine—700 to 800 rpm.

b. Check oil pressure. If no pressure within 30 seconds, shut down engine and investigate.

c. After approximately three minutes, increase engine speed to 1200 rpm.

d. Continue warm-up until oil temperature is within limits.

NOTE

The time required for warm-up will vary considerably with atmospheric temperature.

2-11. TAXIING INSTRUCTIONS. Observe normal taxiing procedure. Individually actuated brakes will aid in making turns, although the steerable tail wheel will be sufficient for most taxiing.

2-12. BEFORE TAKE-OFF. After taxiing to take-off position, set brakes and complete engine ground test and control check as follows:

a. Check engine instruments for desired range.

b. Ignition Switch—Check at 700 rpm, turn ignition switch OFF momentarily and observe that engine completely ceases firing. Perform this check as rapidly as possible in order to prevent a severe backfire when the switch is again turned on. If engine does not cease firing, shut down engine and warn personnel to keep clear of propeller.

c. Power check—Adjust the engine speed to 2400 rpm and note the manifold pressure. This pressure should not vary more than 1 inch.

d. Ignition system check—Accomplish at 2400 rpm for L-16A and at 2300 rpm for L-16B. The maximum allowable drop in engine speed is 75 rpm.

e. Acceleration and deceleration check—Note that engine runs rapidly and smoothly with no tendency to backfire during throttle movement. The maximum rpm obtained during the acceleration should not exceed 2400 rpm.

f. Idle speed—Check at 600 rpm.

g. Set trim tab for best trim, which will depend on loading of the airplane.

NOTE

A neutral setting is recommended if loading consists of two crew members and full fuel, while slightly tail heavy (noseup) setting will result in best trim if airplane is being flown solo from the front seat.

2-13. TAKE-OFF.

2-14. NORMAL TAKE-OFF.

a. Release brakes.

b. Apply full throttle.

c. Follow conventional surface control procedure.

d. Just prior to take-off, a slight back pressure on the control stick will aid the airplane to leave the ground.

e. Best take-off speed—approximately 48 mph IAS.

f. Take-off distance—refer to Take-off, Climb and Landing Charts (See figure A-3).

2-15. MINIMUM RUN TAKE-OFF.

a. Hold airplane with brakes while applying full throttle until engine has attained maximum rpm.

b. Release brakes with control stick slightly forward of a neutral position.

c. During ground-run, hold airplane in slightly "tail-low" postion.

d. At approximately 49 mph IAS, a swift backward movement of the control stick will result in the airplane leaving the ground.

CAUTION

Do not allow tail wheel to strike the ground as this will reduce the forward speed of the airplane.

e. When airborne, climb at approximately 45 mph in the Model L-16A airplane and at 47 mph in the Model L-16B airplane.

2-16. ENGINE FAILURE ON TAKE-OFF. Refer to Section III, Emergency Operating Instructions.

2-17. CLIMB. Refer to Take-off, Climb and Landing Charts for particulars concerning climb characteristics. Use full throttle for climbing. For best rate of climb from sea level, climb at 52 mph IAS in the Model L-16A airplane and at 55 mph IAS in the Model L-16B airplane. For best angle of climb at sea level, climb at 42 mph IAS in the Model L-16A airplane and at 44 mph IAS in the Model L-16B airplane.

2-18. DURING FLIGHT.

2-19. GENERAL FLIGHT CHARACTERISTICS. The airplane is stable under all flight and loading conditions and possesses the flying characteristics generally associated with light airplanes. Use of the elevator trim tab will aid in assuming glides or climbs and in maintaining level flight. The service ceiling of the airplane is 14400 feet.

NOTE

Fuel from auxiliary wing tank should be drained into main tank only when the airplane is in level flight.

2-20. FLIGHT OPERATION. The recommended cruising speed is 92 mph IAS which can be obtained with an engine speed of approximately 2400 rpm. Maximum endurance at sea level at this speed and power is two hours for the Model L-16A airplane and three hours for the Model L-16B airplane when using the auxiliary fuel supply.

NOTE

When flying in a Model L-16A airplane avoid continous engine operation between 2030 and 2270 rpm. Propeller tip vibration occurs within this speed.

2-21. STALLS.

2-22. POWER-ON STALL. The airplane possesses normal stalling characteristics. With 75 percent of maximum rated power the stall occurs at 38 mph true indicated airspeed. Light tail buffet is noticeable just prior to the stall after which the nose will pitch with little or no inadvertent roll or yaw. The stall is progressive and recovery is possible with normal use of the controls.

POWER OFF STALLING SPEEDS			
	STALLING SPEED MPH CALIBRATED I. A. S.		
ANGLE OF BANK (DEGREES)	GROSS WEIGHT		
	1300 lbs.	1220 lbs.	1000 lbs.
0	43.5	42	38
10	43.5	42	38
20	45.5	44	39
30	46.5	45	41
40	49.5	48	43
50	53.5	52	48

Figure 2-1 Power-off Stalling Speed.

2-23. POWER-OFF STALL. Stalls with power off are similar to those with power. The stalling speed of the Model L-16A is 42 mph IAS and the stalling speed for the Model L-16B is 43.5 mph IAS.

2-24. CONTROL AT SPEEDS NEAR THE STALL. The airplane is completely controllable by normal use of the control surfaces. Normal turns with 15° of bank can safely be made at speeds of 10 percent above stalling speed (46 mph for the Model L-16A airplane and 48 mph for the Model L-16B airplane). Beyond the stall, the rudder will be found to be more effective in controlling the airplane than the ailerons.

2-25. SPINS. The airplane possesses normal spinning characteristics. To accomplish recovery, first apply rudder opposite the direction of spin, then ease the stick forward until normal flying speed is attained when airplane can be brought out of the dive. Caution should be exercised so as not to exceed 129 mph IAS in the dive. Avoid abrupt pull-outs.

2-26. PERMISSIBLE ACROBATICS. Although the airplane will satisfactorily perform most of the conventional acrobatic maneuvers, a knowledge and application of

the proper technique is essential to prevent undue stresses in the airplane. In performing the maneuvers, avoid excessive speeds and abrupt pullouts. Following is a list of permitted maneuvers:

a. Normal stall.
b. Normal spin.
c. Slow roll (Do not exceed 85 mph IAS).
d. Vertical bank (Do not exceed 70 degrees).
e. Snap roll (Do not exceed 85 mph IAS).
f. Half roll.

2-27. DIVING. The airplane possesses normal diving characteristics. Do not exceed 129 mph IAS in a dive.

2-28. NIGHT FLYING. The airplane is not equipped with lights and is not intended for night flying.

2-29. APPROACHES.

2-30. NORMAL APPROACH. A normal approach in the airplane should be made power-off at a glide speed of 55 mph. This speed permits ample control in the glide and for the landing "flare," as well as permitting maximum visibility forward and down. If the glide is of long duration the engine should be "cleared" at intervals by short applications of power. The elevator trim tab should be used as an aid in trimming.

2-31. MINIMUM GLIDE OVER AN OBSTACLE. To approach over an obstacle, for landing at a minimum horizontal distance from the obstacle, it is necessary to glide the airplane at a speed just above the stall with a small amount of power. An airspeed of 42 mph for the Model L-16A and 44 mph for the Model L-16B and approximately 1350 rpm will produce the desired glide and permit adequate control of the airplane under normal conditions.

2-32. LANDING.

2-33. NORMAL LANDING. The airplane is conventional in its landing characteristics. Brakes may be applied at any time after landing if required, although caution should be exercised in their use if pilot is flying solo from the front seat. Refer to Take-Off, Climb and Landing Charts for data concerning landings.

2-34. CROSS WIND LANDING. Because of the light weight and low landing speed of the airplane it is advisable to exercise care in making a cross wind landing. Drop the upwind wing slightly and apply slight pressure to opposite rudder to hold a straight glide path.

2-35. MINIMUM RUN LANDING. To accomplish a landing with minimum of landing roll, the airplane should touch down at minimum speed in a three point attitude. Brakes can then be applied as required.

2-36. EMERGENCY LANDING. Refer to Section III, Emergency Operating Procedures.

2-37. GO-AROUND. Should the pilot overshoot the field or be forced to go-around for any reason, full throttle may be applied immediately. In applying the throttle it should be opened completely but not suddenly. A gradual movement of the throttle control will prevent the engine from cutting-out, as will proper "clearing" during the glide. If the trim tab has been moved to tail heavy position for landing, care should be taken to prevent the nose from coming up too fast as power is applied and speed increases.

2-37A. POST FLIGHT CHECK. After the last flight of the day, set the parking brakes and accomplish the following checks.

a. Ignition switch check—Same as Pre-flight.
b. Power Check—Same as Pre-flight.
c. Ignition system check—Same as Pre-flight.
d. Idle speed check—Same as Pre-flight.

2-38. STOPPING THE ENGINE.

a. Idle for two to three minutes to cool engine.
b. Ignition switch—"OFF."
c. After engine stops—open throttle.

2-39. BEFORE LEAVING THE AIRPLANE.

a. Ignition switch "OFF."
b. Main tank fuel valve "OFF."
c. Auxiliary tank fuel valve—"OFF" (L-16B only).
d. Throttle—open.
e. Parking brake—"OFF" after wheels are chocked.

SECTION III
EMERGENCY OPERATING INSTRUCTIONS

3-1. FIRE.

3-2. ENGINE FIRE DURING STARTING

a. Main tank fuel valve "OFF".

b. Ignition - "OFF".

c. Use a carbon dioxide type extinguisher to smother flames at their source.

NOTE
A carbon tetrachloride extinguisher may be used but is not as effective as carbon dioxide type.

3-3. ENGINE FIRE DURING FLIGHT. No direct means are provided for extinguishing an engine fire in flight. Should one occur, the following procedure should be followed:

a. Main tank and auxiliary tank fuel valves "OFF".

b. Ignition switch - "OFF".

c. If fire does not burn itself out, jettison the door and bail out.

3-4. CABIN FIRE IN FLIGHT.

a. Close cabin windows immediately to prevent draft.

b- Attempt to put out fire by any means available.

c. Unless fire can be extinguished immediately, bail out.

NOTE
The fabric fuselage covering will burn very rapidly.

3-5. ENGINE FAILURE.

3-6. ENGINE FAILURE DURING TAKE-OFF.

a. Establish immediate glide at 55 mph IAS.

b. Throttle - closed.

c. Ignition switch - "OFF".

d. Should engine fail below 300 feet, do not attempt bank or turn.

3-7. ENGINE FAILURE DURING FLIGHT.

a. Establish glide at 55 mph IAS.

b. Attempt to start engine.

NOTE
In cases engine has stopped turning and sufficient altitude is available, it can be turned over by diving.

3-8. BAIL-OUT PROCEDURE. Before bailing out, the door should be jettisoned to prevent any part of the door from catching and possibly fouling the parachute. The emergency door release handle (figure 3-1) is located forward of the door hinge line. A safety pin thru the shaft of the handle prevents accidental release. To jettison the door, the following procedure should be followed:

a. Unlatch door with conventional door handle.

b. Pull door release pin ring from emergency handle.

c. Push forward on emergency release handle.

d. Dive out and down from doorway to clear tail surface.

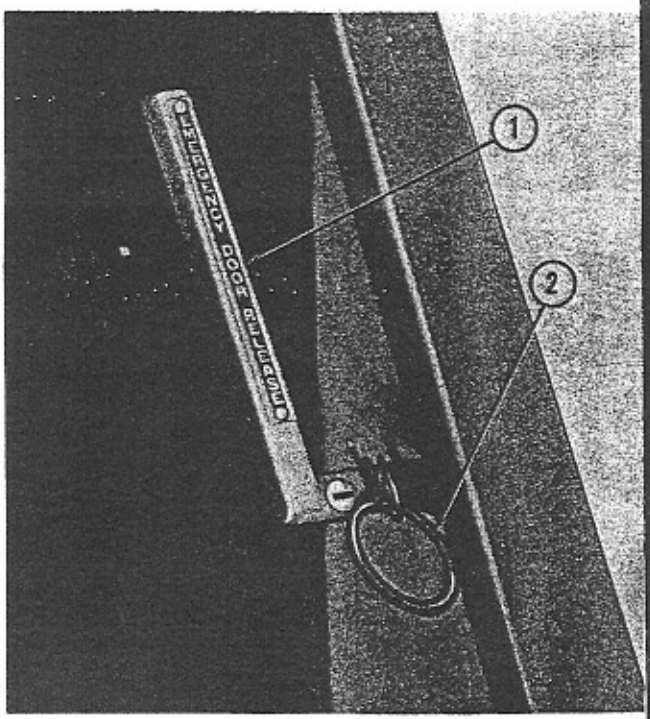


Figure 3-1. Emergency Door Release Handle

3-9. FORCED LANDINGS. Follow normal approach procedures, gliding the airplane at 55 mph IAS. If the ground surface is of a doubtful nature, land at minimum speed. It is practical to figure a one mile glide for each thousand feet of altitude.

SECTION IV
OPERATIONAL EQUIPMENT

4-1. COMMUNICATIONS.

4-2. Radio equipment installed in the Model L-16B airplane consists of a receiver-transmitter (Motorola, Model AT-96-25AA) providing two-way communication with tower and range stations. The equipment is powered with self-contained batteries. The transmitter has a power output of approximately 0.5 watts and has a transmitting range of 3 to 5 miles. Two phone-mike jacks are located in the upper left corner of the radio into which can be plugged two SC R-14 headsets and lip microphones (one set for each crew member).

4-3. The Receiver-Transmitter (figure 4-1) is mounted above and to the left of the front seat. All controls are handy to the occupant of the front seat.

4-4. OPERATION OF RECEIVER-TRANSMITTER.

a. Pull ON-OFF switch out to turn radio "ON".

b. Select desired frequency with tuning knob and adjust for desired signal volume.

c. To transmit, push Press-To-Talk switch DOWN. Speak clearly and directly into the microphone.

d. Push ON-OFF switch in to turn radio "OFF".

4-5. CABIN HEATER. A cabin heater control knob (figure 1-2) is located on the left side of the instrument panel. A flexible control line from the knob is attached to a butterfly valve located in the air duct, leading from the heater jacket surrounding the left exhaust manifold. Pulling out on the control permits flow of warm air to the cabin through a tubular duct which terminates at an opening in the left side of the firewall.

4-6. VENTILATOR. Two ventilators (figure 1-2) are provided in the sides of the metal cowling aft of the firewall, one on each side. Each consits of a cup-shaped scoop formed from clear plastic which may be rotated to permit air to enter or be exhausted from the cabin.

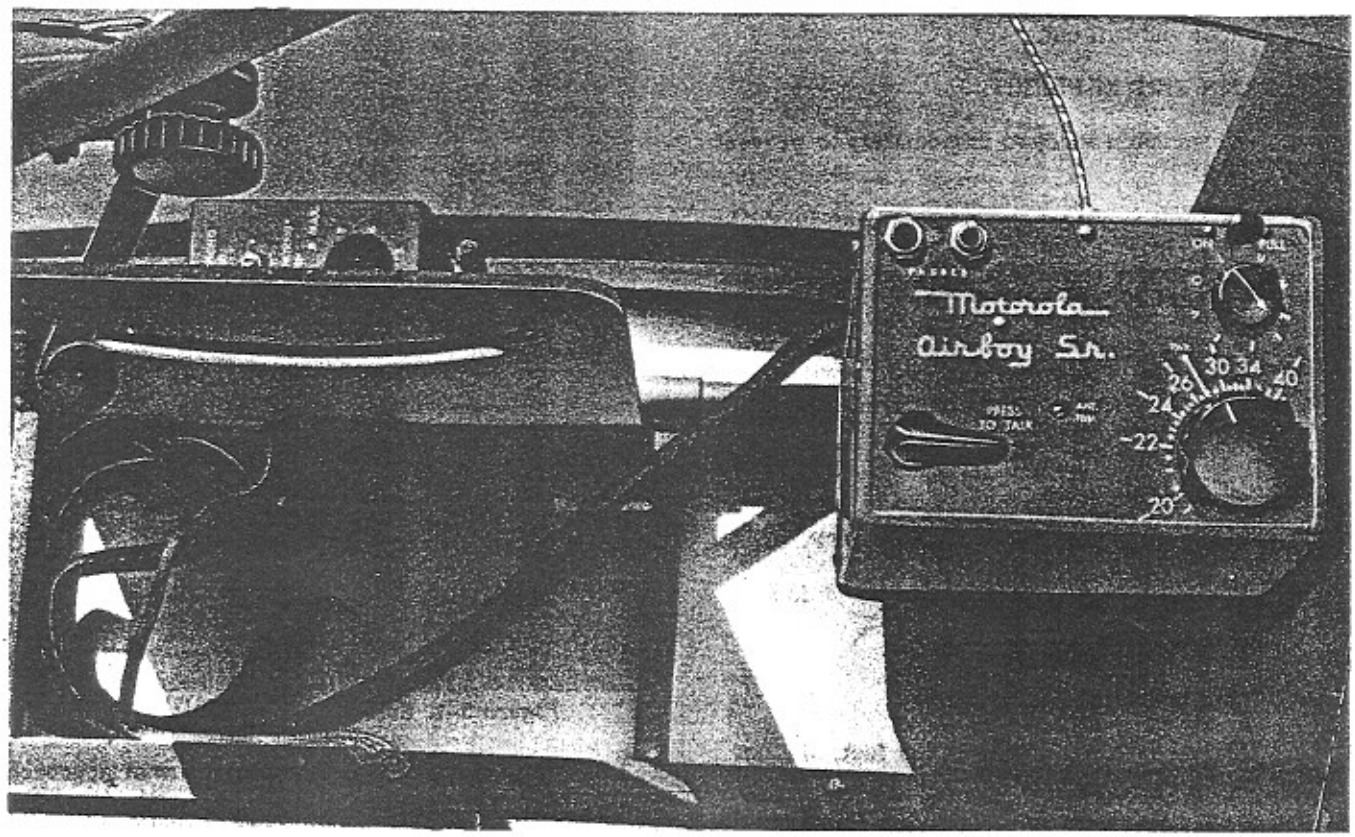


Figure 4-1. Receiver-Transmitter Set, Model L-16B

SECTION V
EXTREME WEATHER OPERATION

5-1. COLD WEATHER OPERATION.

5-2. FABRIC AND PLEXIGLAS SURFACES. Remove snow and ice from the surface of the airplane. Loose snow or ice can be wiped or brushed off. If frozen to the surfaces it can best be removed by placing airplane in a heated hanger or by blowing hot air from a heater unit over the surfaces. If either of these methods cannot be employed, melt the ice with warm water and flush the surface with kerosene or a brine solution, wiping dry with a cloth.

CAUTION

Do not chip ice from fabric or Plexiglas surfaces.

5-3. CONTROL HINGES. Determine that all ice and snow is removed from aileron, rudder, and elevator, hinges. The use of warm air is preferred, but warm water, followed by flushing with kerosene, can be used. Gasoline can be used as the flushing agent if it is not the leaded type. Do not use a brine solution on any metal parts as it will cause corrosion.

5-4. DOOR. In removing ice from the door, determine that hinges are entirely free and that the emergency release will operate.

5-5. WHEELS AND BRAKES. Determine that tires are not frozen to the ground and that brakes operate properly. When operating in snow, do not set parking brake upon leaving airplane, unless absolutely necessary.

5-6. PROPELLER. Make certain that all ice is removed from the propeller blades and hub. Use method outlined in paragraph 5-3.

5-7. FUEL LINE SEDIMENT BOWL. Check sediment bowl, located on lower right forward side of firewall, to determine whether water is present. A sufficient quantity of water can cause the bowl to crack after freezing.

5-8. BEFORE STARTING ENGINE.

a. In operation when temperatures are below 0 F (-18C) it is necessary to pre-heat the oil prior to starting the engine. This can best be done with a hot air heater which should be used to heat the entire engine.

b. If a hot-air heater is not available, it will be necessary to drain the oil and pre-heat, or, dilute with fuel.

5-9. STARTING ENGINE.

a. The engine may be started in the conventional manner (refer to paragraph 2-8). Additional priming will be necessary in extremely cold weather.

b. Warm-up engine in accordance with instructions in paragraph 2-10.

5-10. IN FLIGHT. Check oil temperature and pressure frequently. Extremely cold wheather operation at low power can cause abnormally low oil temperatures and high pressures.

5-11. AFTER FLIGHT.

a. When parking the airplane do not set the parking brake. Use chocks.

b. If parking in snow, place paper, cloth or similar material under the wheels to prevent them from freezing to the ground.

5-12. HOT WEATHER OPERATION.

5-13. GENERAL.

a. If possible park airplane out of direct rays of the sun.

b. After parking the airplane, leave windows and door open to permit circulation of air-thru cabin and prevent excessive temperatures.

c. If operating in sandy or dusty conditions protect engine air intake to prevent particles from entering engine.

5-14. ENGINE OPERATION.

a. Start engine in normal manner. Refer to paragraph 2-8.

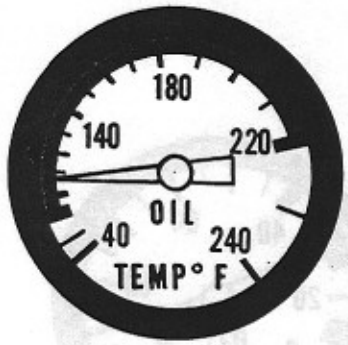
b. Avoid excessive ground operation of the engine.

c. Check oil pressure and temperature frequently.

APPENDIX I
OPERATING CHARTS

AIRSPEED INSTALLATION CORRECTION TABLE	
I. A. S.	CORRECTION
40 mph	ADD 2 mph
60 mph	ADD 1 mph
80 mph	ADD 0 mph
100 mph	SUBTRACT 1 mph
120 mph	SUBTRACT 2 mph
130 mph	SUBTRACT 2 mph

Figure A-1. Airspeed Installation Correction Table.



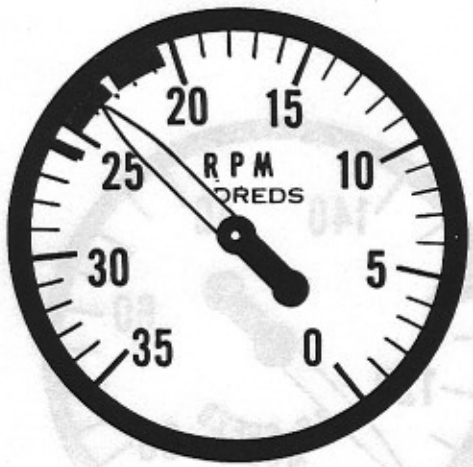
OIL TEMPERATURE

- 90° F. minimum for flight
- 90° to 220° F. normal operation
- 220° F. maximum

OIL PRESSURE

- 10 psi minimum
- 25 to 35 psi normal operation
- 35 psi maximum

FUEL GRADE 80



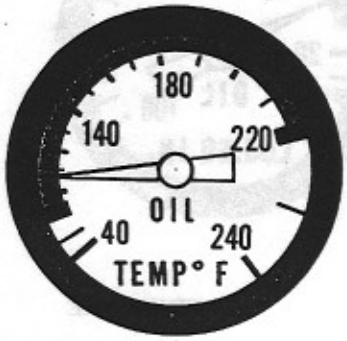
TACHOMETER

- 2030 to 2270 rpm. Avoid continuous operation at this speed. Propeller tip vibration.
- 2300 to 2500 rpm. Normal operating speed.
- 2575 rpm. Maximum engine speed.

AIR SPEED INDICATOR

- 42 mph. indicated, minimum allowable speed.
- 129 mph. indicated, maximum allowable diving speed.

Figure A-2. Instrument Dial Markings, Model L-16A.



OIL TEMPERATURE

- 90° F. minimum for flight
- 90° to 220° F. normal operation
- 220° F. maximum

OIL PRESSURE

- 10 psi minimum
- 25 to 35 psi normal operation
- 40 psi maximum

FUEL GRADE 80

TACHOMETER

- 2000 to 2450 rpm. Normal operating speed.
- 2475 rpm. Maximum engine speed.

AIR SPEED INDICATOR

- 43.5 mph. indicated, minimum allowable speed.
- 129 mph. indicated, maximum allowable diving speed.

Figure A-3. Instrument Dial Markings, Model L-16B.

TAKE-OFF DISTANCES — FEET

MODEL (S): L-16A&B

SOD - TURF RUNWAY

L-16 A 1 ENGINE 0-190-1
L-16B 1 ENGINE 0-205-1

CONFIGURATION AND GROSS WEIGHT	PRESSURE ALTITUDE	−5 DEG. CENT				+15 DEG. CENT.				+35 DEG. CENT				+55 DEG. CENT.			
		ZERO WIND		30 KNOT WIND		ZERO WIND		30 KNOT WIND		ZERO WIND		30 KNOT WIND		ZERO WIND		30 KNOT WIND	
		GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'	GROUND RUN	CLEAR 50'
1350 LB.	SL	195	470	25	60	270	660	35	80	400	950	50	125	540	1275	70	170
	1,000	230	550	30	65	320	780	40	100	460	1100	60	145	630	1500	80	200
	2,000	270	660	35	85	370	900	45	120	565	1350	70	180	760	1800	95	240
	3,000	335	800	42	105	430	1030	50	130	670	1600	85	210	920	2180	115	290
	4,000	400	950	50	125	480	1160	60	150	810	1900	100	250	1100	2640	140	350
	5,000	475	1130	60	150	540	1290	70	170	1000	2400	125	320	1360	3250	170	420
	SL																
	1,000																
	2,000																
	3,000																
	4,000																
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REMARKS:

TAKE-OFF DISTANCES ARE FOR NORMAL TECHNIQUE AS OUTLINED IN SECTION II

DATA AS OF: 2/5/48
DATA BASIS: FLIGHT TEST

FUEL GRADE: 80
FUEL DENSITY: 6.0 (lb/gal.)

Figure A-4. Take-Off Chart, Model L-16A and B.

IL-16A-1

CLIMB CHART FOR NORMAL POWER

Standard Day

MODEL(S): L-16A&B

L-16A 1 ENGINE 0-190-1
L-16B 1 ENGINE 0-205-1

CONFIGURATION: CLEAN
WEIGHT: 1350 LB.

CONFIGURATION:
WEIGHT:

APPROXIMATE RATE OF CLIMB	APPROXIMATE FROM SEA LEVEL DIST.	TIME	FUEL		IAS	PRESSURE ALTITUDE FEET	CAS	M. P. IN. Hg	APPROXIMATE FROM SEA LEVEL FUEL	TIME	DIST.	RATE OF CLIMB
800	0	0	1 (1)		55	S.L.						
540	7	7	2		55	5000						
280	19	19	3		55	10,000						
30	38	37	4		55	15,000						

REMARKS:

1. WARM-UP AND TAKE-OFF ALLOWANCE
2. INCLUDES (1)
3. FULL THROTTLE UP TO NORMAL OPERATING RPM.

RATE OF CLIMB: FEET PER MINUTE
DISTANCE: S. MILES
TIME: MINUTES
FUEL: GALLONS
CAS: CALIBRATION AIRSPEED
M.P.: MANIFOLD PRESSURE

DATA AS OF: 2/5/48
DATA BASIS: FLIGHT TEST

FUEL GRADE: 80
FUEL DENSITY: 6.0 lb/gal

Figure A-5. Climb Chart, Model L-16A and B.

LANDING DISTANCE - FEET

STANDARD DAY

MODEL (S): L-16 A&B

L-16A 1 ENGINE 0-190-1
L-16B 1 ENGINE 0-205-1

GROSS WEIGHT LB	BEST IAS FOR APPROACH		SOD - TURF - NO WIND							
	POWER OFF	POWER ON	AT SEA LEVEL		AT 2000 FT		AT 4000 FT		AT 6000 FT	
	M.P.H.	M.P.H.	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'	GROUND ROLL	CLEAR 50'
1350	53	42	260	1110	275	1150	295	1195	310	1240

REMARKS:

LANDING DISTANCES ARE AIRPLANE REQUIREMENTS UNDER NORMAL SERVICE CONDITIONS.

DATA AS OF: 2/5/48
DATA BASIS: FLIGHT TEST

Figure A-6. Landing Chart, Model L-16A and B.