SECTION 4
NORMAL PROCEDURES

4.1 GENERAL

This section describes the recommended procedures for the conduct of normal operations for the WARRIOR III. All of the required (FAA regulations) procedures and those necessary for operation of the airplane as determined by the operating and design features of the airplane are presented.

Normal procedures associated with those optional systems and equipment which require handbook supplements are provided by Section 9 (Supplements).

These procedures are provided to present a source of reference and review and to supply information on procedures which are not the same for all aircraft. Pilots should familiarize themselves with the procedures given in this section in order to become proficient in the normal operations of the airplane.

The first portion of this section consists of a short form checklist which supplies an action sequence for normal operations with little emphasis on the operation of the systems.

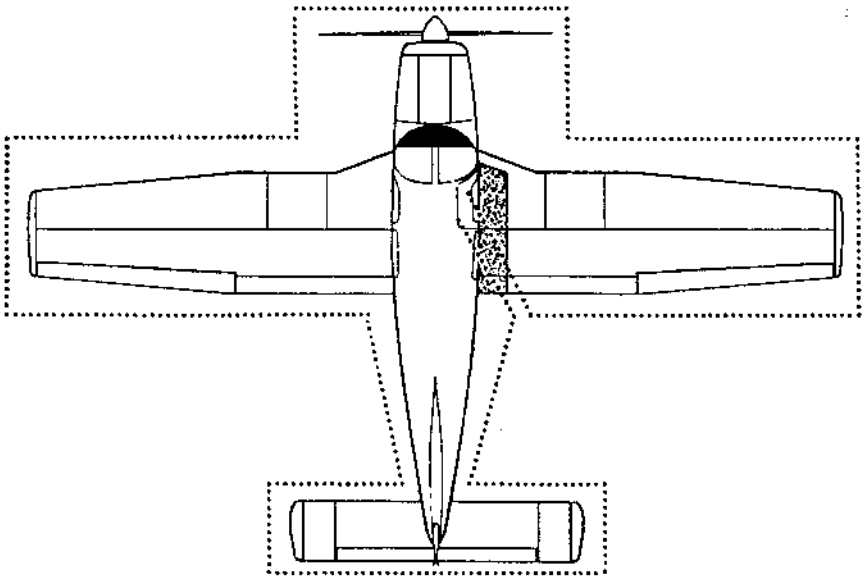
The remainder of the section is devoted to amplified normal procedures which provide detailed information and explanations of the procedures and how to perform them. This portion of the section is not intended for use as an in-flight reference due to the lengthy explanations. The short form checklist should be used for this purpose.

4.3 AIRSPEEDS FOR SAFE OPERATIONS

The following airspeeds are those which are significant to the operation of the airplane. These figures are for standard airplanes flown at gross weight under standard conditions at sea level.

Performance for a specific airplane may vary from published figures depending upon the equipment installed; the condition of the engine, airplane and equipment; atmospheric conditions and piloting technique.

(a)	Best Rate of Climb Speed	79 KIAS
(b)	Best Angle of Climb Speed	63 KIAS
(c)	Turbulent Air Operating Speed (See Subsection 2.3)	111 KIAS
(d)	Maximum Flap Speed	103 KIAS
(e)	Landing Final Approach Speed (Flaps 40°)	63 KIAS
(f)	Maximum Demonstrated Crosswind Velocity	17 KTS



WALK-AROUND
Figure 4-1

4.5 NORMAL PROCEDURES CHECKLIST

PREPARATION

Airplane status.....airworthy, papers on board
Weather.....suitable
Baggage.....weighed, stowed, tied
Weight and C.G.....within limits
Navigation.....planned
Charts and navigation equipment.....on board
Performance and range.....computed and safe

CAUTION:

The flaps must be placed in the UP position for the flap step to support weight. Passengers should be cautioned accordingly.

PREFLIGHT CHECK

COCKPIT

Control wheel ..... release belts
Avionics ..... OFF
Parking brake ..... Set
Electric switches ..... OFF
Magneto switch ..... OFF
Mixture ..... idle cut-off
Battery Master switch ..... ON
Fuel quantity gauges ..... check
Annunciator panel ..... check
Battery Master switch ..... OFF
Flight controls ..... check
Flaps ..... check
Trim ..... check, set neutral
Pitot drain ..... DRAIN, close
Static drain ..... DRAIN, close
Windows ..... check, clean
Tow bar ..... stow
Baggage ..... secure
Baggage door ..... close, secure

RIGHT WING

Wing ..... free of ice, snow, frost
Control surfaces ..... check for interference - free of ice, snow, frost
Hinges ..... check for interference
Static wicks ..... check
Wing tip and lights ..... check
Fuel tank ..... check supply visually - secure caps
Fuel tank sump ..... drain, check for water, sediment and proper fuel
Fuel vent ..... clear
Tie down and chock ..... remove
Main gear strut ..... proper inflation (4.50 in.)
Tire ..... check
Brake block and discs ..... check
Fresh air inlet ..... clear

NOSE SECTION

Fuel and oil .....check for leaks
Cowling.....secure
Windshield.....clean
Propeller and spinner .....check
Air inlets .....clear
Alternator belt .....check tension
Landing light.....check
Nose chock.....remove
Nose gear strut .....proper inflation (3.25 in.)
Nose wheel tire .....check
Oil .. ..check level
Dipstick.....properly seated
Fuel strainer.....drain, check for water, sediment and proper fuel

LEFT WING

Wing .....free of ice, snow, frost
Fresh air inlet.....clear
Main gear strut.....proper inflation (4.50 in.)
Tire .....check
Brake block and discs .....check
Fuel tanks .....check supply visually - secure caps
Fuel tank sumps.....drain, check for water, sediment and proper fuel
Fuel vents .....open
Tie down and chock .....remove
Pitot head .....remove cover - holes clear
Wing tip and lights.....check
Control surfaces .....check for interference - free of ice, snow, frost
Hinges .....check for interference
Static wicks.....check

FUSELAGE

Antennas .....check
Empennage .....Free of ice, snow, frost

Fresh air inlet.....clear
Stabilator and trim tab.....check for interference
Tie down.....remove
Battery Master switch.....ON
Cockpit lighting.....check
Nav and strobe lights.....check
Stall warning.....check
Pitot heat.....check
All switches.....OFF
Passengers.....board
Cabin door.....close and secure
Seat belts and harnesses.....fasten - check interia reel

BEFORE STARTING ENGINE

Brakes.....set
Circuit Breakers.....check IN
Carburetor Heat.....full OFF
Fuel Selector.....desired tank
Radios.....OFF

STARTING ENGINE WHEN COLD

Throttle.....1/4" open
Battery Master switch.....ON
Alternator Switch.....ON
Electric fuel pump.....ON
Mixture.....full RICH
Starter.....engage
Throttle.....adjust
Oil Pressure.....check

If engine does not start within 10 sec., prime and repeat starting procedure.

STARTING ENGINE WHEN HOT

Throttle.....1/2" open
Battery Master switch.....ON
Alternator Switch.....ON
Electric fuel pump.....ON
Mixture.....full RICH
Starter.....engage

Throttle ..... adjust
Oil pressure ..... check

STARTING ENGINE WHEN FLOODED

Throttle ..... open full
Battery Master switch ..... ON
Alternator Switch ..... ON
Electric fuel pump ..... OFF
Mixture ..... idle cut-off
Starter ..... engage
Mixture ..... advance
Throttle ..... retard
Oil pressure ..... check

STARTING ENGINE WITH EXTERNAL POWER SOURCE

Battery Master switch ..... OFF
Alternator Switch ..... OFF
All electrical equipment ..... OFF
Terminals ..... connect
External power plug ..... insert in fuselage

Proceed with normal start

Throttle ..... lowest possible RPM
External power plug ..... disconnect from fuselage
Battery Master switch ..... ON
Alternator Switch ..... ON - check ammeter
Oil Pressure ..... check

WARM-UP

Throttle ..... 800 to 1200 RPM

TAXIING

Chocks ..... removed
Taxi area ..... clear
Throttle ..... apply slowly
Brakes ..... check
Steering ..... check

GROUND CHECK

Throttle ..... 2000 RPM
Magnetos ..... max. drop 175 RPM
-max. diff. 50 RPM
Vacuum ..... 4.8" to 5.2" Hg
Oil temp ..... check
Ammeter ..... check
Oil pressure ..... check
Annunciator panel ..... press-to-test
Carburetor Heat ..... check
(Observe approx. 75 RPM drop)

Engine is warm for takeoff when throttle can be opened without engine faltering.
Electric fuel pump ..... OFF
Fuel pressure ..... check
Throttle ..... RETARD

BEFORE TAKEOFF

Battery Master switch ..... Verify ON
Alternator Switch ..... Verify ON
Flight instruments ..... check
Fuel selector ..... proper tank
Electric fuel pump ..... ON
Engine gauges ..... check
Carburetor heat ..... OFF
Seat backs ..... erect
Mixture ..... set
Belts/harness ..... fastened/check
Empty seats ..... seat belts
snugly fastened
Flaps ..... set
Trim tab ..... set
Controls ..... free
Door ..... latch

TAKEOFF

NORMAL

Flaps.....set
Trim.....set
Accelerate to 45 to 55 KIAS
Control wheel.....back pressure to rotate to climb attitude

0° FLAPS TAKEOFF PERFORMANCE

Flaps.....UP
Accelerate to 40-52 KIAS (depending on weight)
Control Wheel.....back pressure to rotate to climb attitude
Accelerate to and maintain 44 to 57 KIAS (depending on weight) until obstacle clearance is achieved and climb out at 79 KIAS.

25° FLAPS TAKEOFF PERFORMANCE

Flaps.....25° (second notch)
Accelerate to 40-52 KIAS (depending on weight)
Control Wheel.....back pressure to rotate to climb attitude
Accelerate to and maintain 44 to 57 KIAS (depending on weight) until obstacle clearance is achieved and climb out at 79 KIAS.
Flaps.....retract slowly

SOFT FIELD, OBSTACLE CLEARANCE

Flaps.....25° (second notch)
Accelerate and lift off nose gear as soon as possible. Lift off at lowest possible airspeed. Accelerate just above ground to 52 KIAS to climb past obstacle height. Continue climbing while accelerating to best rate of climb speed, 79 KIAS.
Flaps.....retract slowly

SOFT FIELD, NO OBSTACLE

Flaps.....25° (second notch)
Accelerate and lift off nose gear as soon as possible. Lift off at lowest possible airspeed. Accelerate just above ground to best rate of climb speed, 79 KIAS.
Flaps.....retract slowly

CLIMB

Best rate (flaps up).....79 KIAS
Best angle (flaps up).....63 KIAS
En route.....87 KIAS
Electric fuel pump.....OFF at desired altitude

CRUISING

Reference performance charts and Avco-Lycoming Operators Manual.
Normal max power.....75%
Power.....set per power table
Mixture.....adjust

DESCENT

NORMAL

Throttle.....2500 rpm
Airspeed.....126 KIAS
Mixture.....rich
Carburetor heat.....ON if required

POWER OFF

Carburetor heat.....ON if required
Throttle.....close
Airspeed.....as required
Mixture.....as required
Power.....verify with throttle every 30 seconds

APPROACH AND LANDING

Fuel selector ..... proper tank
Seat backs ..... erect
Belts/harness ..... fasten/check
Electric fuel pump ..... ON
Mixture ..... set
Flaps ..... set - 103 KIAS max
Trim to 70 KIAS
Final approach speed (flaps 40°) ..... 63 KIAS

STOPPING ENGINE

Flaps ..... retract
Electric fuel pump ..... OFF
Radios ..... OFF
Throttle ..... full aft
Mixture ..... idle cut-off
Magnetos ..... OFF
Alternator Switch ..... OFF
Battery Master switch ..... OFF

PARKING

Parking brake ..... set
Control wheel ..... secure with belts
Flaps ..... full up
Wheel chocks ..... in place
Tie downs ..... secure

4.7 AMPLIFIED NORMAL PROCEDURES (GENERAL)

The following paragraphs are provided to supply detailed information and explanations of the normal procedures necessary for the safe operation of the airplane.

4.9 PREFLIGHT CHECK

PREPARATION

The airplane should be given a thorough preflight and walk-around check. The preflight should include a check of the airplane's required papers, operational status, computation of weight and C.G. limits, takeoff and landing distances, and in-flight performance. A weather briefing should be obtained for the intended flight path, and any other factors relating to a safe flight should be checked before takeoff.

CAUTION

The flap position should be noted before boarding the airplane. The flaps must be placed in the UP position before they will lock and support weight on the step.

COCKPIT

Upon entering the cockpit, release the seat belts securing the control wheel, turn OFF all avionics equipment, and set the parking brake. Insure that all electrical switches and the magneto switch are OFF and that the mixture is in idle cut-off. Turn ON the Battery Master Switch, check the fuel quantity gauges for adequate supply and check that the annunciator panel illuminates. Turn OFF the Battery Master Switch. Check the primary flight controls and flaps for proper operation and set the trim to neutral. Open the pitot and static drains to remove any moisture that has accumulated in the lines. Check the windows for cleanliness. Properly stow the tow bar and baggage and secure. Close and secure the baggage door.

RIGHT WING

Begin the walk-around at the trailing edge of the right wing by checking that the wing surface and control surfaces are clear of ice, frost, snow or other extraneous substances. Check the flap, aileron and hinges for damage and operational interference. Static wicks should be firmly attached and in good condition. Check the wing tip and lights for damage.

Open the fuel cap and visually check the fuel color and the quantity should match the indication that was on the fuel quantity gauge, replace cap securely. The fuel tank vent should be clear of obstructions.

Drain the fuel tank through the quick drain located at the lower inboard rear corner of the tank, making sure that enough fuel has been drained to insure that all water and sediment is removed. The fuel system should be drained daily prior to the first flight and after each refueling and checked for proper fuel.

CAUTION

When draining any amount of fuel, care should be taken to insure that no fire hazard exists before starting engine.

Remove the tie down and chock.

Next, a check of the landing gear. Check the gear strut for proper inflation; there should be 4.50± .25 inches of strut exposure under a normal static load. Check the tire for cuts, wear, and proper inflation. Make a visual check of the brake block and disc.

Check that the fresh air inlet is clear of foreign matter.

NOSE SECTION

Check the general condition of the nose section, look for oil or fluid leakage and that the cowling is secure. Check the windshield and clean if necessary. The propeller and spinner should be checked for detrimental nicks, cracks, or other defects. The air inlets should be clear of obstructions and check the alternator belt for proper tension. The landing light should be clean and intact.

Remove the chock and check the nose gear strut for proper inflation, there should be 3.25± .25 inches of strut exposure under a normal static load. Check the tire for cuts, wear, and proper inflation. Check the engine baffle seals. Check the oil level, make sure that the dipstick has been properly seated.

Open the fuel strainer located on the left side of the firewall long enough to remove any accumulation of water and sediment and check for proper fuel.

LEFT WING

The wing surface should be clear of ice, frost, snow, or other extraneous substances. Check that the fresh air inlet is clear of foreign matter and remove the chock. Check the main gear strut for proper inflation, there should be 4.50± .25 inches of strut exposure under a normal static load. Check the tire and the brake block and disc.

Open the fuel cap and visually check the fuel color. The quantity should match the indication on the fuel quantity gauge. Replace cap securely. The fuel tank vent should be clear of obstructions. Drain enough fuel to insure that all water and sediment has been removed and check for proper fuel.

Remove tie down and chock. Remove the cover from the pitot/static head on the underside of the wing. Make sure the holes are open and clear of obstructions. Check the wing tip and lights for damage. Check the aileron, flap, and hinges for damage and operational interference and that the static wicks are firmly attached and in good condition.

FUSELAGE

Check the condition and security of the antennas. The empennage should be clear of ice, frost, snow, or other extraneous substances, and the fresh air inlet on the side of fuselage should be clear of foreign matter. Check the stabilator and trim tab for damage and operational interference. The trim tab should move in the same direction as the stabilator. Remove the tie down.

Upon returning to the cockpit, an operational check of the interior lights, exterior lights, stall warning system, and pitot heat should now be made. Turn the battery master switch and other appropriate switches ON. Check the panel lighting and the overhead flood light. Visually confirm that exterior lights are operational. Lift the stall detector on the leading edge of the left

wing and determine that the warning horn is activated. With the pitot heat switch ON, the pitot head will be hot to the touch. After these checks are complete, the battery master switch and all electrical switches should be turned OFF.

Board the passengers and close and secure the cabin door. Fasten the seat belts and shoulder harnesses. Pull test the locking restraint feature of the shoulder harness inertia reel. Fasten seat belts on empty seats.

4.11 BEFORE STARTING ENGINE

Before starting the engine, the brakes should be set. Check to make sure all the circuit breakers are IN and the carburetor heat OFF. The fuel selector should then be moved to the desired tank. Check to make sure that all the radios are OFF.

4.13 STARTING ENGINE

(a) Starting Engine When Cold

Open the throttle lever approximately 1/4 inch. Turn ON the battery master switch, alternator switch and the electric fuel pump.

Move the mixture control to full RICH and engage the starter by rotating the magneto switch clockwise. When the engine fires, release the magneto switch, and move the throttle to the desired setting.

If the engine does not fire within five to ten seconds, disengage the starter, prime the engine and repeat the starting procedure (priming is accomplished by lifting the switch guard and depressing the momentary electric prime button for the desired time.)

(b) Starting Engine When Hot

Open the throttle approximately 1/2 inch. Turn ON the Battery Master Switch, alternator switch and the electric fuel pump. Move the mixture control lever to full RICH and engage the starter by rotating the magneto switch clockwise. When the engine fires, release the magneto switch and move the throttle to the desired setting.

(c) Starting Engine When Flooded

The throttle lever should be full OPEN. Turn ON the battery master and alternator switches and turn OFF the electric fuel pump. Move the mixture control lever to idle cut-off and engage the starter by rotating the magneto switch clockwise. When the engine fires, release the magneto switch, advance the mixture and retard the throttle.

(d) Starting Engine With External Power Source

An External Power receptacle allows the operator to use an external battery to crank the engine without having to gain access to the airplane's battery.

Verify that the battery master switch, alternator switch, and all electrical equipment is OFF. Insert the plug of a 28 volt DC aux power jumper cable into the socket located on the fuselage. Note that when the plug is inserted, the electrical system is ON. Proceed with the normal starting technique.

After the engine has started reduce power to the lowest possible RPM, to reduce sparking, and disconnect the jumper cable from the aircraft. Turn the battery master and Alternator Switches ON and check the alternator ammeter for an indication of output. DO NOT ATTEMPT FLIGHT IF THERE IS NO INDICATION OF ALTERNATOR OUTPUT.

NOTE

For all normal operations using the Aux Power jumper cables, the battery master switch and alternator switch should be OFF, but it is possible to use the ship's battery in parallel by turning the battery master switch and alternator switch ON. This will give longer cranking capabilities, but will not increase the amperage.

CAUTION

Care should be exercised, because, if the ship's battery has been depleted, the external power supply can be reduced to the level of the ship's battery. This can be tested by turning the battery master switch and alternator switch ON momentarily while the starter is engaged. If cranking speed increases, the ship's battery is at a higher level than the external power supply.

When the engine is firing evenly, advance the throttle to 800 rpm. If oil pressure is not indicated within thirty seconds, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get an oil pressure indication. If the engine has failed to start, refer to the Lycoming Operating Handbook, Engine Troubles and Their Remedies.

Starter manufacturers recommend that cranking periods be limited to thirty seconds with a two minute rest between cranking periods. Longer cranking periods will shorten the life of the starter.

4.15 WARM-UP

Warm-up the engine at 800 to 1200 RPM for not more than two minutes in warm weather and four minutes in cold. Avoid prolonged idling at low RPM, as this practice may result in fouled spark plugs.

Takeoff may be made as soon as the ground check is completed, provided that the throttle may be opened fully without backfiring or skipping, and without a reduction in engine oil pressure.

Do not operate the engine at high rpm when running up or taxiing over ground containing loose stones, gravel or any loose material that may cause damage to the propeller blades.

4.17 TAXIING

Before attempting to taxi the airplane, ground personnel should be instructed and approved by a qualified person authorized by the owner. Ascertain that the propeller back blast and taxi areas are clear.

Power should be applied slowly to start the taxi roll. Taxi a few feet forward and apply the brakes to determine their effectiveness. While taxiing, make slight turns to ascertain the effectiveness of the steering.

Observe wing clearances when taxiing near buildings or other stationary objects. If possible, station an observer outside the airplane.

Avoid holes and ruts when taxiing over uneven ground.

Do not operate the engine at high rpm when running up or taxiing over ground containing loose stones, gravel or any loose material that may cause damage to the propeller blades.

4.19 GROUND CHECK

The magnetos should be checked at 2000 RPM. Drop off on either magneto should not exceed 175 RPM and the difference between the magnetos should not exceed 50 RPM. Operation on one magneto should not exceed 10 seconds.

Check the vacuum gauge; the indicator should read 4.8" to 5.2" Hg at 2000 RPM.

Check the ammeter for proper indication.

Check the annunciator panel lights with the press-to-test button.

Carburetor heat should also be checked prior to takeoff to be sure the control is operating properly and to clean any ice which may have formed during taxiing. Avoid prolonged ground operation with carburetor heat ON as the air is unfiltered.

The electric fuel pump should be turned OFF after starting or during warm-up to make sure that the engine driven pump is operating. Check both oil temperature and oil pressure. The temperature may be low for some time if the engine is being run for the first time of the day. The engine is warm enough for takeoff when the throttle can be opened without the engine faltering.

4.21 BEFORE TAKEOFF

All aspects of each particular takeoff should be considered prior to executing the takeoff procedure.

Insure that the battery master switch and Alternator Switch are ON. Check and set all of the flight instruments as required. Check the fuel selector to make sure it is on the proper tank (fullest). Turn ON the electric fuel pump to prevent loss of power should the engine driven pump fail during takeoff, and check the engine gauges. The carburetor heat should be in the OFF position.

All seat backs should be erect and the seat belts and shoulder harness should be fastened. Pull test the locking restraint feature of the shoulder harness inertia reel. Fasten the seat belts snugly around the empty seats.

The mixture should be set.

NOTE

The mixture should be set FULL RICH, but a minimum amount of leaning is permitted for smooth engine operation when taking off at high elevation.

Exercise and set the flaps and trim tab. Insure proper flight control movement and response. The door should be properly secured and latched.

4.23 TAKEOFF (See charts in Section 5)

The normal takeoff technique is conventional. The trim should be set slightly aft of neutral, with the exact setting determined by the loading of the airplane. Allow the airplane to accelerate to 45 to 55 KIAS depending on the weight of the aircraft and ease back on the control wheel to rotate to climb attitude. Premature raising of the nose or raising it to an excessive angle will result in a delayed takeoff. After takeoff, let the airplane accelerate to the desired climb speed by lowering the nose slightly.

Takeoffs are normally made with flaps up; however, for short field takeoffs and for takeoffs under difficult conditions, such as deep grass or a soft surface, total distances can be reduced appreciably by lowering the flaps to 25° and rotating at lower airspeed.

A short field takeoff is accomplished without flaps by applying full power before brake release; lift off at 40-52 KIAS (depending on weight) and accelerate to and maintain 44-57 KIAS (depending on weight) past obstacle and climb out at 79 KIAS.

A short field takeoff with an obstacle clearance is accomplished by first lowering the flaps to 25°. Apply full power before brake release and accelerate to 40-52 KIAS (depending on weight) and rotate. Accelerate to and maintain 44-57 KIAS (depending on weight) until obstacle clearance is attained. After the obstacle has been cleared, accelerate to 79 KIAS and then slowly retract the flaps.

Takeoff from a soft field with an obstacle clearance requires the use of 25° flaps. Accelerate the airplane and lift the nose gear off as soon as possible and lift off at the lowest possible airspeed. Accelerate just above the ground to 52 KIAS to climb past obstacle clearance height. Continue climbing while accelerating to the best rate of climb speed, 79 KIAS and slowly retract the flaps.

For a soft field takeoff without an obstacle to clear, extend the flaps 25°, accelerate the airplane and lift the nose gear off as soon as possible. Lift off at the lowest possible airspeed. Accelerate just above the ground to the best rate of climb speed, 79 KIAS, and retract the flaps while climbing out.

4.25 CLIMB

The best rate of climb at gross weight will be obtained at 79 KIAS. The best angle of climb may be obtained at 63 KIAS. At lighter than gross weight these speeds are reduced somewhat. For climbing en route, a speed of 87 KIAS is recommended. This will produce better forward speed and increased visibility over the nose during the climb.

When reaching the desired altitude, the electric fuel pump may be turned off.

4.27 CRUISE

The cruising efficiency and speed is determined by many factors, including power setting, altitude, temperature, loading and equipment installed in the airplane.

The normal cruising power is 55% to 75% of the rated horsepower of the engine. Airspeeds which may be obtained at various altitudes and power settings can be determined from the performance graphs provided by Section 5.

Use of the mixture control in cruising flight significantly reduces fuel consumption while reducing lead deposits when alternate fuels are used. The mixture should be full rich when operating above 75% power, and leaned during cruising operation when 75% power or less is being used.

To lean the mixture for best power cruise performance place the mixture control full forward and set the throttle slightly below (approximately 35 RPM) the desired cruise power setting and lean the mixture to peak RPM. Adjust the throttle, if necessary, for final RPM setting.

For Best Economy cruise, a simplified leaning procedure which consistently allows accurate achievement of best engine efficiency has been developed. Best Economy Cruise performance is obtained with the throttle fully open. To obtain a desired cruise power setting, set the throttle and mixture control full forward, taking care not to exceed the engine speed limitation, then begin leaning the mixture. The RPM will increase slightly but will then begin to decrease. Continue leaning until the desired cruise engine RPM is reached. This will provide best fuel economy and maximum miles per gallon for a given power setting. See following CAUTION when using this procedure.

CAUTION

Prolonged operation at powers above 75% with a leaned mixture can result in engine damage. While establishing Best Economy Cruise Mixture, below 6,000 feet, care must be taken not to remain in the range above 75% power more than 15 seconds while leaning. Above 6,000 feet the engine is incapable of generating more than 75%.

Always remember that the electric fuel pump should be turned ON before switching tanks, and should be left on for a short period thereafter. In order to keep the airplane in best lateral trim during cruising flight, the fuel should be used alternately from each tank. It is recommended that one tank be used for one hour after takeoff, then the other tank be used for two hours; then return to the first tank, which will have approximately one and one half hours of fuel remaining if the tanks were full at takeoff. The second tank will contain approximately one half hour of fuel. Do not run tanks completely dry in flight. The electric fuel pump should be normally OFF, so that any malfunction of the engine driven fuel pump is immediately apparent. If signs of fuel starvation should occur at any time during flight, fuel exhaustion should be suspected, at which time the fuel selector should be immediately positioned to the other tank and the electric fuel pump switched to the ON position.

4.29 DESCENT

NORMAL

To achieve the performance on Figure 5-31, a power on descent must be used. The throttle should be set for 2500 RPM, mixture full rich and maintain an airspeed of 126 KIAS. In case carburetor ice is encountered apply full carburetor heat.

POWER OFF

If a prolonged power off descent is to be made, apply full carburetor heat prior to power reduction if icing conditions are suspected,. Throttle should be retarded and mixture control leaned as required. Power response should be verified approximately every 30 seconds by partially opening and then closing the throttle (clearing the engine). When leveling off, enrichen mixture, set power as required and select carburetor heat off unless carburetor icing conditions are suspected.

4.31 APPROACH AND LANDING (See charts in Section 5)

Check to insure the fuel selector is on the proper (fullest) tank and that the seat backs are erect. The seat belts and shoulder harnesses should be fastened and the inertia reel checked.

Turn the electric fuel pump ON. The mixture should be set in the full RICH position.

The airplane should be trimmed to an initial-approach speed of about 70 KIAS with a final-approach speed of 63 KIAS with flaps extended to 40°. The flaps can be lowered at speeds up to 103 KIAS, if desired.

The mixture control should be kept in full RICH position to insure maximum acceleration if it should be necessary to open the throttle again. Carburetor heat should not be applied unless there is an indication of carburetor icing, since the use of carburetor heat causes a reduction in power which may be critical in case of a go-around. Full throttle operation with carburetor heat on can cause detonation.

The amount of flap used during landings and the speed of the aircraft at contact with the runway should be varied according to the landing surface and conditions of wind and airplane loading. It is generally good practice to contact the ground at the minimum possible safe speed consistent with existing conditions.

Normally, the best technique for short and slow landings is to use full flap and enough power to maintain the desired airspeed and approach flight path. Mixture should be full RICH, fuel on the fullest tank, and electric fuel pump ON. Reduce the speed during the flareout and contact the ground close to the stalling speed. After ground contact hold the nose wheel off as long as possible. As the airplane slows down, gently lower the nose and apply the brakes. Braking is most effective when flaps are raised and back pressure is applied to the control wheel, putting most of the aircraft weight on the main wheels. In high wind conditions, particularly in strong cross-winds, it may be desirable to approach the ground at higher than normal speeds with partial or no flaps.

4.33 STOPPING ENGINE

At the pilot's discretion, the flaps should be raised and the electric fuel pump turned OFF. The radios should be turned OFF, and the engine stopped by disengaging the mixture control lock and pulling the mixture control back to idle cut-off. The throttle should be left full aft to avoid engine vibration while stopping. Then the magneto, alternator and battery master switches must be turned OFF.

NOTE

When alternate fuels are used, the engine should be run up to 1200 RPM for one minute prior to shutdown to clean out any unburned fuel.

NOTE

The flaps must be placed in the UP position for the flap step to support weight. Passengers should be cautioned accordingly.

4.35 PARKING

If necessary, the airplane should be moved on the ground with the aid of the nose wheel tow bar provided with each airplane and secured behind the rear seats. The aileron and stabilator controls should be secured by looping the safety belt through the control wheel and pulling it snug. The flaps are locked when in the UP position and should be left retracted.

Tie downs can be secured to rings provided under each wing and to the tail skid. The rudder is held in position by its connections to the nose wheel steering and normally does not have to be secured.

4.37 STALLS

The stall characteristics are conventional. An approaching stall is indicated by a stall warning horn which is activated between five and ten KTS above stall speed. Mild airframe buffeting and gentle pitching may also precede the stall.

The gross weight stalling speed with power off and full flaps is 44 KIAS. With the flaps up this speed is increased. Loss of altitude during stalls varies from 100 to 275 feet, depending on configuration and power.

NOTE

The stall warning system is inoperative with the master switch OFF.

During preflight, the stall warning system should be checked by turning the master switch ON, lifting the detector and checking to determine if the horn is actuated. The master switch should be returned to the OFF position after the check is complete.

4.39 TURBULENT AIR OPERATION

In keeping with good operating practice used in all aircraft, it is recommended that when turbulent air is encountered or expected, the airspeed be reduced to maneuvering speed to reduce the structural loads caused by gusts and to allow for inadvertent speed build-ups which may occur as a result of the turbulence or of distractions caused by the conditions. (See Subsection 2.3.)

4.41 WEIGHT AND BALANCE

It is the responsibility of the owner and pilot to determine that the airplane remains within the allowable weight vs. center of gravity envelope while in flight.

For weight and balance data, refer to Section 6 (Weight and Balance).

4.43 NOISE LEVEL

The noise level of this aircraft is 72.9 dB(A).

No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

The above statement notwithstanding, the noise level stated above has been verified by and approved by the Federal Aviation Administration in noise level test flights conducted in accordance with FAR 36, Noise Standards - Aircraft Type and Airworthiness Certification. This aircraft model is in compliance with all FAR 36 noise standards applicable to this type.