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NORMAL PROCEDURES

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SECTION 4

NORMAL PROCEDURES

4.1 GENERAL

This section describes the recommended procedures for the conduct of normal operations for the Archer 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 check list 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 check list should be used for this purpose.

4.3 AIRSPEEDS FOR SAFE OPERATIONS

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

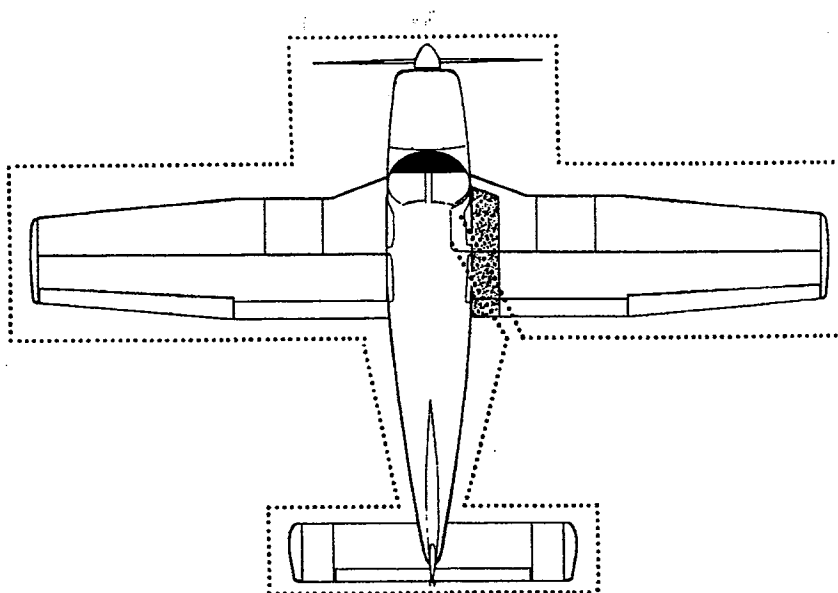
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Performance for a specific airplane may vary from published figures depending upon the equipment installed, the condition of the engine, airplane and equipment, atmospheric conditions and piloting technique.

- | | |
|--|----------|
| (a) Best Rate of Climb Speed | 76 KIAS |
| (b) Best Angle of Climb Speed | 64 KIAS |
| (c) Turbulent Air Operating Speed (See Subsection 2.3) | 113 KIAS |
| (d) Maximum Flap Speed | 102 KIAS |
| (e) Landing Final Approach Speed (Flaps 40) | 66 KIAS |
| (f) Maximum Demonstrated Crosswind Velocity | 17 KTS |



WALK-AROUND
Figure 4-1

4.5 NORMAL PROCEDURES CHECK LIST

PREFLIGHT CHECK

COCKPIT

- Control wheelrelease restraints
- Parking brakeset
- AvionicsOFF
- All switchesOFF
- Mixtureidle cut-off
- Magneto switchesOFF
- Battery master switchON
- Fuel gaugescheck quantity
- Annunciator panelcheck
- Battery master switchOFF
- Flapsextend
- Primary flight controlsproper operation
- Trimneutral
- Pitot and static systemsdrain
- Windowscheck clean

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NORMAL PROCEDURES

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Required papers and POHcheck on board
Tow bar and baggage.....stow properly - secure
Baggage doorclose and secure

RIGHT WING

Surface condition.....clear of ice, frost, snow
Flap and hingescheck
Aileron and hingescheck
Static wickscheck - secure
Wing tip and lights.....check
Fuel tank.....check supply
visually - secure cap
Fuel tank ventclear

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

Fuel tank sumpsdrain and check for
water, sediment and proper fuel
Tie down and chockremove
Main gear strut.....proper
inflation (4.5 ± .25 in.)
Tirecheck
Brake block and disc.....check
Fresh air inlet.....clear

NOSE SECTION

General condition.....check
Cowling.....secure
Windshieldclean
Propeller and spinnercheck
Air inletsclear
Engine baffle sealscheck
Chockremove
Nose gear strutproper
inflation (3.25 ± .25 in.)
Nose wheel tirecheck
Oilcheck quantity
Dipstick.....properly seated
Oil filler capsecure

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

Fuel strainerdrain

LEFT WING

Surface conditionclear of ice, frost, snow
Fresh air inlet.....clear

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

Fuel tank sumpdrain and check for
water, sediment and proper fuel

Fuel tank ventclear

Main gear strut.....proper
inflation (4.5 ± .25 in.)

Tirecheck

Brake block and disc.....check

Tie down and chockremove

Fuel tank.....check supply
visually - secure cap

Pitot/static head.....remove cover - holes clear

Wing tip and lights.....check

Aileron and hingescheck

Flap and hingescheck

Static wicks.....check secure

FUSELAGE

Antennascheck

Empennageclear of ice, frost, snow

Stabilator and trim tabcheck

Tie down.....remove

**SECTION 4
NORMAL PROCEDURES**

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MISCELLANEOUS

Battery master switchON
Flapsretract
Interior lightingON and check
Pitot heat switchON
Pitot heat OFF/INOP Annunciatorextinguished

CAUTION: Care should be taken when an operational check of the heated pitot head is being performed. The unit becomes very hot. Ground operation should be limited to three minutes to avoid damaging the heater elements.

NOTE: Secure and adjust all unused seat belts and shoulder harness to prevent control interference or passenger injury during flight in turbulent air.

Exterior lighting switchesON and check
Pitotcheck - warm
Stall warning horncheck
All lighting switchesOFF
Pitot heat switchOFF
Pitot heat OFF/INOP Annunciatorilluminated
Battery master switchOFF
Passengersboard
DoorClosed and secure
Seatsadjusted and /locked in position
Seat belts and harnessfasten/adjust
check inertia reel

ENGINE START - GENERAL

CAUTION: Do not attempt flight if there is no indication of alternator output.

CAUTION: If a positive oil pressure is not indicated within 30 seconds following an engine start, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get a positive oil pressure indication.

BEFORE STARTING ENGINE

Brakesset
 Circuit breakerscheck in
 Alternate static sourceOFF
 Carburetor heatfull cold
 AvionicsOFF
 Fuel selectordesired tank

NORMAL START - COLD ENGINE

Throttle1/4 in. open
 Battery master switch.....ON
 Alternator switch.....ON
 Left magneto switchON
 Electric fuel pumpON
 Mixturefull RICH
 Propellerclear
 Starterengage
 Throttleadjust
 Right magneto switchON
 Oil pressure.....check

NOTE: If engine does not start within 10 seconds, prime and repeat starting procedure. Starter manufacturer recommends starter cranking periods be limited to 10 seconds with a 2 minute rest period between cranking periods. Maximum of 5 start periods allowed. If start is not achieved on fifth attempt allow starter to cool for 30 minutes before attempting additional starts.

NORMAL START - HOT ENGINE

Throttle1/2 in. open
 Battery master switch.....ON
 Alternator switch.....ON
 Left magneto switchON
 Electric fuel pumpON
 Mixturefull RICH
 Propellerclear
 Starterengage
 Throttleadjust
 Right magneto switchON
 Oil pressure.....check

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NORMAL PROCEDURES

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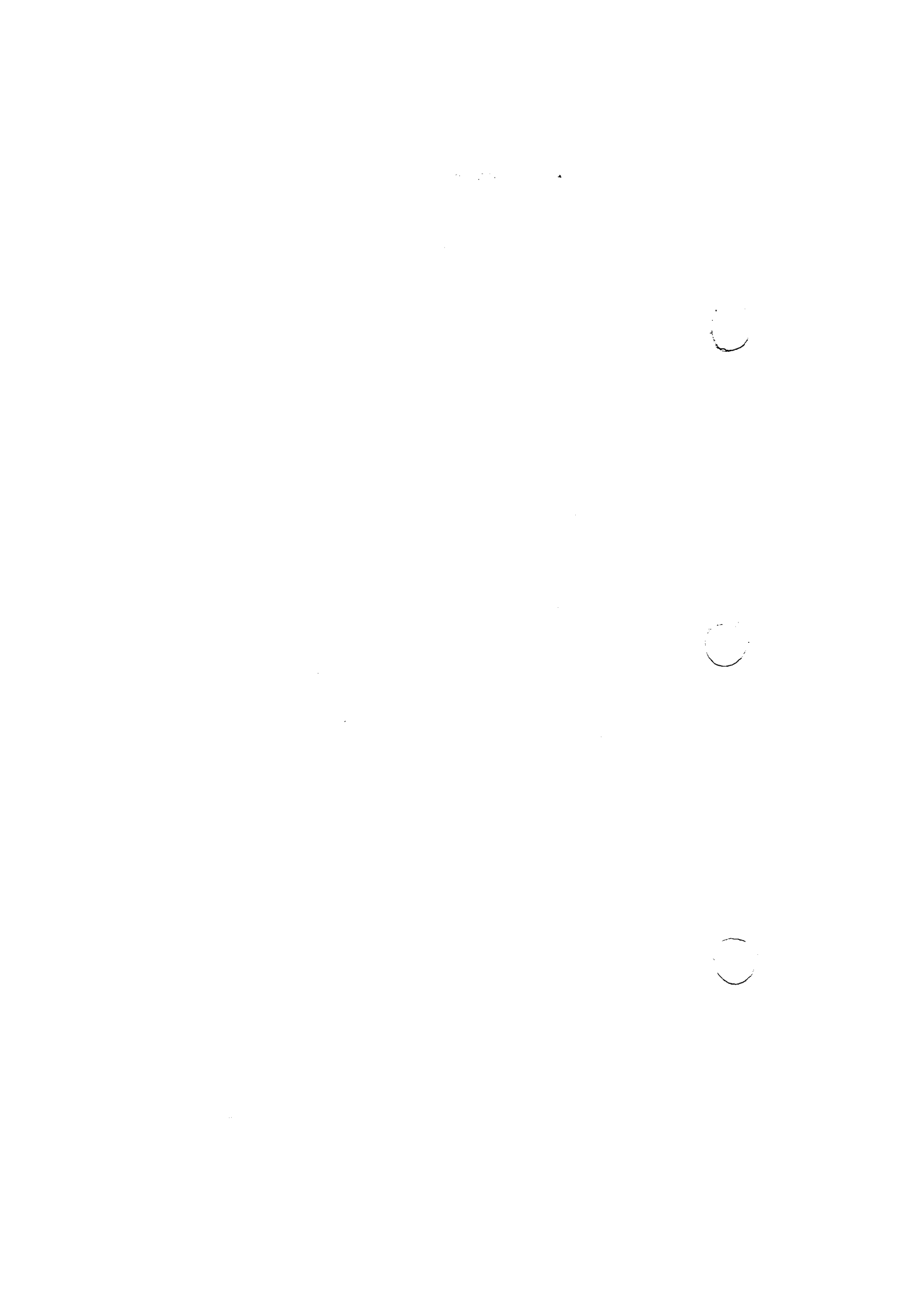
ENGINE START WHEN FLOODED

Throttleopen full
Battery master switch.....ON
Alternator switch.....ON
Left magneto switchON
Electric fuel pumpOFF
Mixture.....idle cut-off
Propellerclear
Starterengage
Mixtureadvance
Throttleretard
Right magneto switchON
Oil Pressurecheck

STARTING WITH EXTERNAL POWER SOURCE

CAUTION: It is possible to use the ship's battery in parallel by turning only the battery master switch ON. This will give longer cranking capabilities, but will not increase the amperage. Care should be exercised 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 only the battery master 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. If the battery is at a lower level than the external power supply, continue starting with the battery master switch off.

Battery master switchOFF
Alternator switchOFF
Left magneto switchON
All electrical equipment.....OFF
Terminalsconnect
External power pluginsert in fuselage



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BEFORE TAKEOFF

Battery master switch.....verify ON
Alternator switch.....verify ON
Magnetos.....verify ON
Flight instrumentscheck
Fuel selector.....proper tank
Electric fuel pumpON
Engine gaugescheck
Carburetor heatOFF
Mixtureset
Seat backserect
Seatsadjusted and locked in position
Belts/harness.....fastened/check
Empty seatsseat belts securely fastened
Flaps.....set
Trimset
Controls.....free
Doorlatched
Air conditioner (if installed)OFF

TAKEOFF

NORMAL TECHNIQUE

Flaps.....set
Trimset

Accelerate to 60 KIAS

Control wheelback pressure to smoothly rotate
to climb attitude

SHORT FIELD, OBSTACLE CLEARANCE

Flaps25 (second notch)
 Trimslightly aft of neutral
 Throttlefull power prior to
 brake release

Accelerate to 55 KIAS depending on aircraft weight.

Control wheelback pressure to rotate
 to climb attitude

After breaking ground, accelerate to 60 KIAS depending on aircraft weight.

Accelerate to best flaps up angle of climb speed - 64 KIAS.

Flapsretract slowly
 (obstacle cleared & safe altitude)

Accelerate to best flaps up rate of climb speed - 76 KIAS.

CLIMB

Best rate (flaps up)76 KIAS

Best angle. (flaps up)64 KIAS

En route87 KIAS

Electric fuel pumpOFF at desired altitude

CRUISING

Powerset per power table

Mixtureadjust

DESCENT

NORMAL

Throttle2500 rpm

Airspeed122 KIAS

MixtureRICH

Carburetor heatON if required

POWER OFF

Carburetor heatON if required

Throttleclosed

Airspeedas required

Mixtureas required

Powerverify with throttle
 every 30 seconds

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APPROACH AND LANDING

Fuel selectorproper tank
Seat backserect
Seatsadjusted and locked in position
Belts/harnessfasten/adjust
Electric fuel pumpON
Mixtureset
Flapsset - 102 KIAS max
Air conditioner (if installed)OFF
Initial approach speed75 KIAS
Final approach speed (flaps 40°)66 KIAS

STOPPING ENGINE

CAUTION:

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

Flapsretract
Electric fuel pumpOFF
Air conditioner (if installed)OFF
Avionics master switchOFF
Electrical switchesOFF
Throttle.....closed
Mixtureidle cut-off
Magneto switchesOFF
Alternator switchOFF
Battery master switchOFF

MOORING

Parking brakeset
Flapsfull up
Control wheelsecured with belts
Wheel chocks.....in place
Tie downssecure

INTENTIONALLY LEFT BLANK

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NORMAL PROCEDURES

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4.7 PREFLIGHT CHECK

The airplane should be given a thorough preflight and walk-around check. The preflight should include a check of the airplane's operational status, computation of weight and C.G. limits, takeoff distance 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. Set the parking brake by first depressing and holding the toe brake pedals and then pull the parking brake lever while depressing the knob attached to the top of the handle. Insure that all electrical switches are OFF. Turn OFF all avionics equipment (to save power and prevent wear on the units). The mixture should be in idle cut-off and the magneto switches in the OFF position. Turn ON the battery master switch, check the fuel quantity gauges for adequate supply, check that the annunciator panel illuminates. Turn OFF the battery master switch. Check the primary flight controls for proper operation, extend the flaps 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 and that the required papers are on board. Properly stow and secure the tow bar and baggage. 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 supply. Replace cap securely. The fuel tank vent should be clear of obstructions.

Place a container under the quick drain. Drain the fuel tanks through the quick drain prior to the first flight and after refueling, making sure that enough fuel has been drained to verify the proper fuel and insure that all water and sediment is removed.

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, complete a check of the landing gear. Check the gear strut for proper inflation; there should be $4.5 \pm .25$ 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. Check the engine baffle seals

Remove the chock and check the nose gear strut for proper inflation; there should be $3.25 \pm .25$ inches of strut exposure under a normal static load. Check the tire for cuts, wear, and proper inflation. Check the oil level; make sure that the dipstick has been properly seated and that the oil filler cap has been properly secured. Drain the fuel strainer valve located on the bottom left side of the engine compartment.

CAUTION

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

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 tie downs and chocks. Check the gear strut for proper inflation; there should be $4.5 \pm .25$ inches of strut exposure under a normal static load. Check the tire and the brake block and disc.

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Open the fuel cap and visually check the fuel supply. Replace cap securely. The fuel tank vent should be clear of obstructions. Place a container under the quick drain. Drain enough fuel to verify the proper fuel and to insure that all water and sediment has been removed.

CAUTION

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

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. Check that the static wicks are firmly attached and in good condition.

FUSELAGE

Check the condition of any antennas located on the fuselage. All surfaces of the empennage should be examined for damage and operational interference and clear of ice, frost and snow. Fairings and access covers should be attached properly. Check the baggage to be sure it is stowed properly. Check that the lights on the tail are clean and intact. The stabilator and rudder should be operational and free from interference of any type. Check the condition of the tabs and insure that all hinges and push rods are sound and operational. If the tail has been tied down, remove the tie down rope.

MISCELLANEOUS

Turn the battery master switch "ON" and begin checking the interior lights by turning "ON" the necessary switches. After the interior lights are checked, turn "ON" the pitot heat switch and the exterior light switches. Next, perform a walk-around check on the exterior lights. With the pitot heat on the pitot heat OFF/INOP annunciator will extinguish informing the pilot that the pitot heat is activated.

Check the heated pitot head for proper heating. Turn all electrical switches and battery master switch OFF. Verify that the pitot heat OFF/INOP annunciator illuminates when pitot heat is turned OFF.

CAUTION:

Care should be taken when an operational check of the heated pitot head is being performed. The unit becomes very hot. Ground operation should be limited to three minutes maximum to avoid damaging the heating elements.

When all passengers are on board, the pilot should check the cabin doors for proper closing and latching procedures. The door should be gently pulled shut, the door handle firmly latched and the overhead latch button turned to the "LOCK" position. Seat belts on empty seats should be snugly fastened. All passengers should fasten their seat belts and shoulder harnesses. Adjust and lock seats in position.

NOTE:

With the shoulder harness fastened and adjusted, a pull test of it's locking restraint feature should be performed.

4.9 ENGINE START - GENERAL

CAUTION:

Do not attempt flight if there is no indication of alternator output.

CAUTION:

If a positive oil pressure is not indicated within 30 seconds following an engine start, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get a positive oil pressure indication.

NOTE:

Starter manufacturer recommends starter cranking periods be limited to 10 seconds with a 2 minute rest period between cranking periods. Maximum of 5 start periods allowed. If start is not achieved on fifth attempt allow starter to cool for 30 minutes before attempting additional starts.

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 is off. Check that the avionics master switch is OFF. Check the fuel selector control to verify the desired tank.

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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, left magneto switch and the electric fuel pump.

Move the mixture control to full RICH, verify the propeller area is clear and engage the starter. When the engine fires, release the starter switch, and move the throttle to the desired setting. Turn ON the right magneto switch. Check the oil pressure for a positive indication.

If the engine does not fire within five to ten seconds, disengage the starter, prime the engine and repeat the starting procedure.

(b) Normal Start; Hot Engine

Open the throttle approximately 1/2 inch. Turn ON the battery master switch, alternator switch, left magneto switch and the electric fuel pump. Move the mixture control lever to full RICH, verify the propeller area is clear and engage the starter. When the engine fires, release the starter switch and move the throttle to the desired setting. Turn ON the right magneto switch. Check the oil pressure for a positive indication.

(c) Engine Start When Flooded

The throttle lever should be full OPEN. Turn ON the battery master switch, alternator switch, left magneto switch, and turn OFF the electric fuel pump. Move the mixture control lever to idle cut-off, verify the propeller area is clear and engage the starter. When the engine fires, release the starter switch, advance the mixture and retard the throttle. Turn ON the right magneto switch. Check the oil pressure for a positive indication.

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(d) Starting Engine With External Power Source

CAUTION:

It is possible to use the ship's battery in parallel by turning only the battery master switch ON. This will give longer cranking capabilities, but will not increase the amperage. Care should be exercised 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 only the battery master 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. If the battery is at a lower level than the external power supply, continue starting with the battery master switch off.

Verify that the battery master, alternator switches are OFF, left magneto switch is ON, and all electrical equipment is OFF. Connect the RED lead of the PEP kit jumper cable to the POSITIVE (+) terminal of an external 24-volt battery and the BLACK lead to the NEGATIVE (-) terminal. Insert the plug of the 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 turn ON the right magneto switch. 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. Check the oil pressure for a positive indication. **DO NOT ATTEMPT FLIGHT IF THERE IS NO INDICATION OF ALTERNATOR OUTPUT.**

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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

Set the parking brake.

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 annunciator panel lights with the press-to-test button. Also check the air conditioner.

Carburetor heat should also be checked prior to takeoff to be sure the control is operating properly and to clear any ice which may have formed during taxiing. Avoid prolonged ground operation with carburetor heat "ON" as the air is unfiltered. Engine RPM should decrease no more than 75 RPM when carburetor heat is on. If no or excessive RPM decrease is observed, investigate and have the cause corrected prior to flight.

The electric fuel pump should be turned OFF after starting or during warm-up to make sure that the engine driven pump is operating. Prior to takeoff the electric pump should be turned ON again to prevent loss of power during takeoff should the engine driven pump fail.

4.21 BEFORE TAKEOFF

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

Verify that the battery master, alternator, magneto switches are ON and 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 and check the engine gauges. The carburetor heat should be in the OFF position.

All seat backs should be erect with all seats adjusted and locked in position.

The mixture should be set. The seat belts and shoulder harness should be fastened and adjusted. Fasten the seat belts snugly around the empty seats.

NOTE

With the shoulder harness fastened and adjusted, a pull test of its locking restraint feature should be performed.

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Exercise and set the flaps and trim tab. Insure proper flight control movement and response.

All doors should be properly secured and latched.

On air conditioned models, the air conditioner must be OFF to insure normal takeoff performance.

4.23 TAKEOFF

NORMAL TECHNIQUE (SEE CHART, SECTION 5)

When the available runway length is well in excess of that required and obstacle clearance is no factor, the normal takeoff technique may be used. The flaps should be set in the retracted position and the pitch trim set slightly aft of neutral. Align the airplane with the runway, apply full power, and accelerate to 60 KIAS depending on weight. Apply back pressure to the control wheel to lift off, then control pitch attitude as required to attain the desired climb speed.

SHORT FIELD TECHNIQUE (SEE CHART, SECTION 5)

For departure from short runways with adjacent obstructions, a short field takeoff technique with flaps set to 25° should be used in accordance with the short field takeoff ground roll - flaps 25° and short field performance - flaps 25° charts. Maximum power is established before brake release and the airplane is accelerated to 55 KIAS depending on aircraft weight for liftoff. After liftoff, control the airplane attitude to accelerate to 60 KIAS depending on aircraft weight, passing through the 50 foot obstacle height. Once clear of the obstacle accelerate to the best flaps up angle of climb speed of 64 KIAS while retracting the flaps. Transition to 76 KIAS, flaps up best rate of climb speed.

4.25 CLIMB

The best rate of climb at gross weight will be obtained at 76 KIAS. The best angle of climb may be obtained at 64 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 CRUISING

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

The normal maximum cruising power is 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 reduces fuel consumption significantly, especially at higher altitudes. The mixture should be leaned during cruising operation above 5000 ft. altitude and at pilot's discretion at lower altitudes when 75% power or less is being used. If any doubt exists as to the amount of power being used, the mixture should be in the full RICH position for all operations under 5000 feet.

To lean the mixture, disengage the lock and pull the mixture control back.

Best economy mixture is obtained by slowly leaning the mixture until engine operation becomes rough or until engine power rapidly diminishes. When either condition occurs, enrich the mixture sufficiently to obtain an evenly firing engine. Some engine power and airspeed must be sacrificed to gain a best economy mixture setting.

Best power mixture is obtained by gradually leaning the mixture until either the tachometer or the airspeed indicator reading peaks.

If the airplane is equipped with the optional exhaust gas temperature (EGT) gauge, a more accurate means of leaning is available to the pilot. Best economy mixture is obtained by moving the mixture control aft until peak EGT is reached. Best power mixture is obtained by leaning to peak EGT and then enriching until the EGT is 100F. rich of the peak value. Under some conditions of altitude and throttle position, the engine may exhibit roughness before peak EGT is reached. If this occurs, the EGT corresponding to the onset of engine roughness should be used as the peak reference value.

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

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4.27 CRUISING

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Use of the mixture control in cruising flight reduces fuel consumption significantly, especially at higher altitudes. The mixture should be leaned during cruising operation above 5000 ft. altitude and at pilot's discretion at lower altitudes when 75% power or less is being used. If any doubt exists as to the amount of power being used, the mixture should be in the full RICH position for all operations under 5000 feet.

To lean the mixture, disengage the lock and pull the mixture control back.

The airplane is equipped with a exhaust gas temperature (EGT) gauge, a more accurate means of leaning for the pilot. Best economy mixture is obtained by moving the mixture control aft until peak EGT is reached. Best power mixture is obtained by leaning to peak EGT and then enrichening until the EGT is 100F. rich of the peak value. Under some conditions of altitude and throttle position, the engine may exhibit roughness before peak EGT is reached. If this occurs, the EGT corresponding to the onset of engine roughness should be used as the peak reference value.

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

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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 the power on descent must be used. The throttle should be set for 2500 RPM, mixture full rich and maintain an airspeed of 122 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

Check to insure the fuel selector is on the proper (fullest) tank and that the seat backs are erect, with the seats adjusted and locked in position. The seat belts and shoulder harness should be fastened and adjusted and the inertia reel checked.

NOTE

With the shoulder harness fastened and adjusted, a pull test of its locking restraint feature should be performed.

Turn ON the electric fuel pump and turn OFF the air conditioner. The mixture should be set in the full RICH position.

The airplane should be trimmed to an initial approach speed of about 75 KIAS with a final approach speed of 66 KIAS with flaps extended. The flaps can be lowered at speeds up to 102 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 crosswinds, 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.

NOTE

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

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The air conditioner (when installed) and 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.

4.35 MOORING

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

The gross weight stalling speed of the ARCHER III with power off and full flaps is 45 KIAS. With the flaps up this speed is increased 5 KTS. Loss of altitude during stalls varies from 100 to 350 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

(a) FAR 36 Appendix G for aircraft with the standard exhaust system, the noise level is 73.1 dB(A). For aircraft with the optional exhaust system, the noise level is 71.9 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.

(b) ICAO 10 for aircraft with the standard exhaust system, the noise level is 77.7 dB(A). For aircraft with the optional exhaust system, the noise level is 75.3 dB(A).

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