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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 Warrior II. 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 safe 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	
gear up, flaps up	90 KIAS
gear down, flaps up	78 KIAS
(b) Best Angle of Climb Speed	
gear up, flaps up	78 KIAS
gear down, flaps up	72 KIAS
(c) Turbulent Air Operating Speed (See Subsection 2.3)	118 KIAS
(d) Maximum Flap Speed	103 KIAS
(e) Landing Final Approach Speed (Flaps 40°)	75 KIAS
(f) Maximum Demonstrated Crosswind Velocity	17 KTS

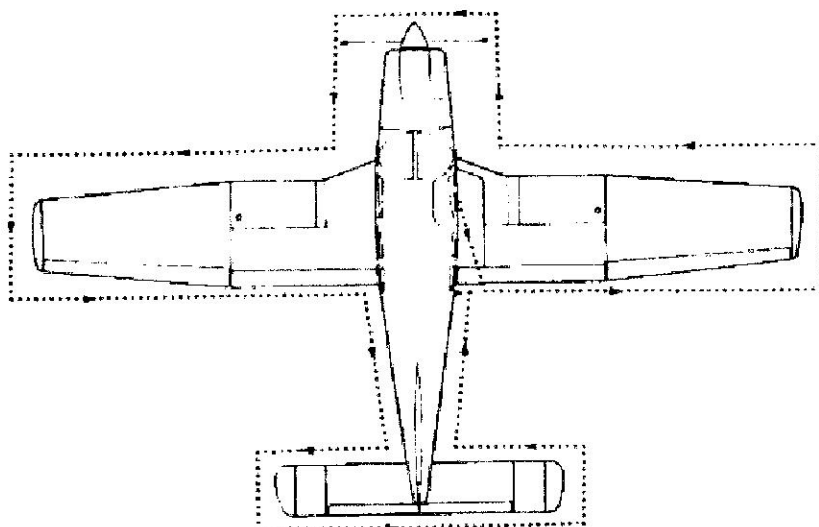
**WALK-AROUND**

Figure 4-1

**4.5 NORMAL PROCEDURES CHECKLIST****4.5a Preflight Checklist (4.9)***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 (4.9a)**

Control Wheel .....	release restraints
Gear Handle .....	DOWN
Parking Brake .....	SET
Avionics .....	OFF
All Switches .....	OFF
Mixture .....	IDLE CUT-OFF
Magneto Switch .....	OFF
BATT MASTR Switch .....	ON

**4.5a Preflight Checklist (4.9) (continued)**

**COCKPIT (4.9a) (continued)**

Fuel Gauges .....check QUANTITY  
Annunciator Panel.....CHECK  
BATT MASTR Switch.....OFF  
Primary Flight Controls.....PROPER OPERATION  
Flaps .....PROPER OPERATION  
Trim.....NEUTRAL  
Pitot and Static Systems.....DRAIN  
Windows .....check CLEAN  
Required Papers and POH .....check ON BOARD  
Tow Bar and Baggage.....STOW PROPERLY - SECURE  
Baggage Door.....CLOSE and SECURE

**RIGHT WING (4.9b)**

Surface Condition .....CLEAR of ICE, FROST, SNOW  
Flap and Hinges .....CHECK  
Aileron and Hinges .....CHECK  
Static Wicks.....CHECK - SECURE  
Wing Tip and Lights .....CHECK  
Fuel Tank .....CHECK supply  
visually - SECURE cap  
Fuel Tank Vent.....CLEAR

**CAUTION**

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

Fuel Tank Sump.....DRAIN and CHECK  
for water, sediment,  
and proper fuel  
Tie Down and Chock .....REMOVE  
Main Gear Strut .....PROPER INFLATION  
(2.0 +/- 0.25 in.)  
Tire .....CHECK  
Brake Block and Disc .....CHECK  
Fresh Air Inlet .....CLEAR

**4.5a Preflight Checklist (continued)****NOSE SECTION (4.9c)**

General Condition .....	CHECK
Cowling .....	SECURE
Oil .....	CHECK QUANTITY
Dipstick .....	PROPERLY SEATED
Oil Filler Cap .....	SECURE
Engine Baffle Seals .....	CHECK
Windshield .....	CLEAN
Propeller and Spinner .....	CHECK
Air Inlets .....	CLEAR
Alternator Belt .....	CHECK TENSION
Landing Light .....	CHECK
Chock .....	REMOVE
Nose Gear Strut .....	PROPER INFLATION (2.75 +/- 0.25 in.)
Nose Wheel Tire .....	CHECK

**CAUTION**

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

Fuel Strainer .....	DRAIN
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**LEFT WING (4.9d)**

Surface Condition .....	CLEAR of ICE, FROST, SNOW
Stall Warning Vane .....	CHECK
Fuel Tank .....	CHECK Supply visually - SECURE CAP
Fresh Air Inlet .....	CLEAR
Chock .....	REMOVE
Main Gear Strut .....	PROPER INFLATION (2.0 +/- 0.25 in.)
Tire .....	CHECK
Brake Block and Disc .....	CHECK
Fuel Tank Vent .....	CLEAR

**CAUTION**

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

**4.5a Preflight Checklist (continued)****LEFT WING (4.9d) (continued)**

Fuel Tank Sump.....DRAIN and CHECK  
for water, sediment,  
and proper fuel

Tie Down.....REMOVE

Pitot Mast.....REMOVE COVER  
- HOLE CLEAR

Wing Tip and Lights .....CHECK

Aileron and Hinges .....CHECK

Flap and Hinges .....CHECK

Static Wicks.....CHECK - SECURE

**FUSELAGE (4.9e)**

Antennas .....CHECK

Left Static Vent.....CLEAR

Fresh Air Inlet .....CLEAR

Empennage .....CLEAR of ICE,  
FROST, SNOW

Stabilator and Trim Tab .....CHECK

Tie Down.....REMOVE

Right Static Vent.....CLEAR

BATT MASTR Switch.....ON

Cockpit Lighting.....CHECK

Navigation and Strobe Lights .....CHECK

Landing Light.....CHECK

Stall Warning.....CHECK

Pitot Heat .....CHECK

All Switches .....OFF

BATT MASTR Switch.....OFF

Passengers.....BOARD

Cabin Door.....CLOSE and SECURE

Seat Belts and Harness.....FASTEN - CHECK  
inertia reel

**4.5b Before Starting Engine Checklist (4.11)****BEFORE STARTING ENGINE (4.11)**

Brakes.....SET

Circuit Breakers.....IN

Alternate Air.....OFF

Propeller .....FULL INCREASE RPM

Avionics.....OFF

Fuel Selector .....DESIRED TANK

### NORMAL START - COLD ENGINE (4.13)

### **NORMAL START - HOT ENGINE (4.13b)**

### ENGINE START WHEN FLOODED (4.13c)

### ENGINE START WITH EXTERNAL POWER SOURCE (4.13d)

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4.5c Engine Start Checklist (4.13) (continued)

ENGINE START WITH EXTERNAL POWER SOURCE (4.13d)  
(continued)

Terminals .....CONNECT  
External Power Plug .....INSERT in receptacle

Proceed with normal start.

Throttle .....LOWEST POSSIBLE RPM  
External Power Plug .....REMOVE from receptacle  
BATT MASTR Switch .....ON  
ALTR Switch .....ON - CHECK AMMETER  
Oil Pressure .....CHECK

**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 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 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.

**NOTE**

For all normal operations using the PEP jumper cables, the battery master and alternator switches should be OFF.

4.5d Warm-Up Checklist (4.15)

WARM-UP (4.15)

Throttle .....1400 to 1500 RPM

## TAXING (4.17)

#### 4.5f Ground Check Checklist (4.19)

#### 4.5g Before Takeoff Checklist (4.21)

BATT MASTR Switch .....ON  
ALTR Switch .....ON  
Flight Instruments .....CHECK

## 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  
Air conditioner ..... OFF  
Trim to 70 KIAS  
Final approach speed (flaps 40°) ..... 63 KIAS

## **STOPPING ENGINE**

Flaps ..... retract  
Electric fuel pump ..... OFF  
Air conditioner ..... OFF  
Radios ..... OFF  
Throttle ..... full aft  
Mixture ..... idle cut-off  
Magnetos ..... OFF  
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 master switch, check the fuel quantity gauges for adequate supply and check that the annunciator panel illuminates. Turn OFF the 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  $4.50 \pm .25$  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 and check the alternator belt for proper tension. The landing light should be clean and intact.

Remove the choek 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 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 fire wall 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 choek. Check the main gear strut for proper inflation, there should be  $4.50 \pm .25$  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 choek. Remove the cover from the pilot/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 master switch and the 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 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 ON and the carburetor heat lever moved to the full OFF position. 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 turn. Turn ON the master 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.



**(b) Starting Engine When Hot**

Open the throttle approximately 1/2 inch. Turn ON the master 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 master switch 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 optional feature called the Piper External Power (PEP) allows the operator to use an external battery to crank the engine without having to gain access to the airplane's battery.

Turn the master switch OFF and turn all electrical equipment OFF. Connect the RED lead of the PEP kit jumper cable to the POSITIVE (+) terminal of an external 12-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 disconnect the jumper cable from the aircraft. Turn the master switch 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 PEP jumper cables, the master switch should be OFF, but it is possible to use the ship's battery in parallel by turning the master 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 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.

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" - 5.1" 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 clean any ice which may have formed during taxiing. Avoid prolonged ground operation with carburetor heat ON as the air is unfiltered.