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SECTION 4

NORMAL PROCEDURES

4.1 GENERAL

This section clearly describes the recommended procedures for the conduct of normal operations for the Cherokee Warrior. All of the required (FAA regulations) procedures and those necessary for the 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 in 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.

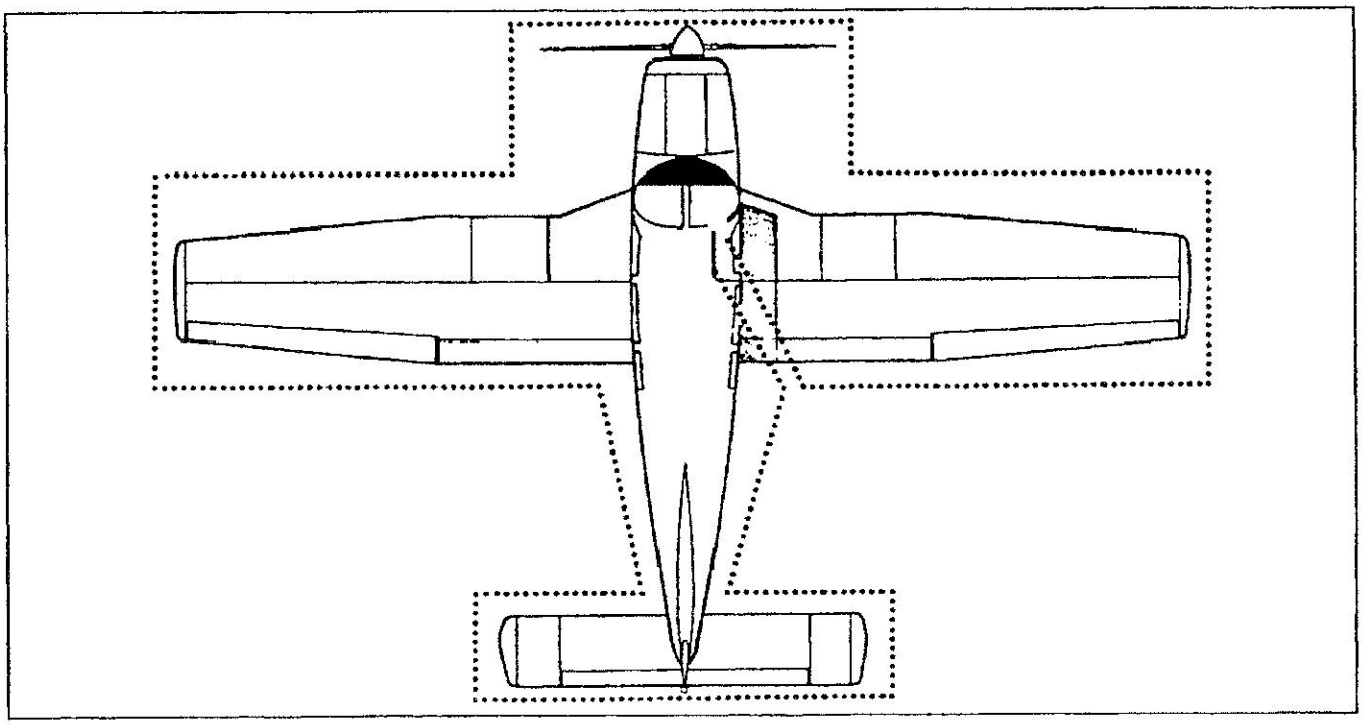
The remainder of the section is devoted to amplified normal procedures which provide detailed information and explanations of the procedures and how to perform them. This portion of the section is not intended for use as an in-flight reference due to the lengthly explanations. The short form checklist 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	75 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

PREFLIGHT CHECK

Control wheel .....release belts
Parking brake .....set
Master switch .....ON
Fuel quantity gauges .....check
Master switch .....OFF
Ignition .....OFF
Exterior .....check for damage
Control surfaces .....check for interference - free of ice, snow, frost
Hinges .....check for interference
Wings .....free of ice, snow, frost
Stall warning .....check
Navigation lights .....check
Fuel tanks .....check supply visually - secure caps
Fuel tank sumps .....drain and check for water, sediment, and proper fuel
Fuel vents .....open
Main gear struts .....proper inflation (4.50 in.)
Tires .....check
Brake blocks .....check
Pitot head .....remove cover - holes clear
Windshield .....clean
Propeller and spinner .....check
Fuel and oil .....check for leaks
Oil .....check level
Dipstick .....properly seated
Cowling .....secure
Inspection covers .....secure
Nose wheel tire .....check
Nose gear strut .....proper inflation (3.25 in.)
Air inlets .....clear
Alternator belt .....check tension
Tow bar and control locks .....stow
Baggage .....stowed properly - secure
Baggage door .....close and secure
Fuel strainer .....drain and check for water, sediment, and proper fuel
Primary flight controls .....proper operation
Cabin door .....close and secure
Required papers .....on board
Seat belts and harness .....fastened - check inertia reel

BEFORE STARTING ENGINE

Parking brake.....set
Carburetor heat.....full OFF
Fuel selector.....desired tank

STARTING ENGINE WHEN COLD

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

STARTING ENGINE WHEN FLOODED

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

STARTING WITH EXTERNAL POWER SOURCE

Master 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
Master switch.....ON - check ammeter
Oil pressure.....check

WARM-UP

Throttle.....800 to 1200 RPM

TAXIING

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

GROUND CHECK

Parking brake.....set
Throttle.....2000 RPM
Magnetos.....max. drop 175 RPM -max. diff. 50 RPM
Vacuum.....5.0" Hg. +/ - .1
Oil temp.....check
Oil pressure.....check
Annunciator panel.....press-to-test
Carburetor heat.....check
Engine is warm for takeoff when throttle can be opened without engine faltering.
Electric fuel pump.....OFF
Fuel pressure.....check
Throttle.....retard

BEFORE TAKEOFF

Master switch .....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
Empty seats .....seat belts snugly fastened
Flaps .....set
Trim tab .....set
Controls .....free
Doors .....latched
Parking brake .....released

TAKEOFF

NORMAL

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

SHORT FIELD, OBSTACLE CLEARANCE

Flaps .....25° (second notch)
Accelerate to 52 KIAS
Control wheel .....back pressure to rotate to climb attitude
Maintain 52 KIAS until obstacle clearance
Accelerate to 75 KIAS after obstacle is cleared
Flaps .....retract slowly

SHORT FIELD, NO OBSTACLE

Flaps .....UP
Accelerate to 50 KIAS
Control wheel .....back pressure to rotate to climb attitude
After breaking ground, accelerate to best rate of climb speed, 75 KIAS

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, 75 KIAS
Flaps .....slowly retract

SOFT FIELD, NO OBSTACLE

Flaps .....25° (second notch)
Accelerate and lift nose gear as soon as possible.
Lift off at lowest possible airspeed
Accelerate just above ground to best rate of climb speed, 75 KIAS
Flaps .....slowly retract

CLIMB

Best rate (flaps up) .....75 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 Operator's Manual.
Normal max. power 75%
Power .....set per power table
Mixture .....adjust

APPROACH AND LANDING

Fuel selector .....proper tank
Seat backs .....erect
Belts/harness .....fasten
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
Master switch.....OFF

PARKING

Parking brake .....set
Control wheel .....secured 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 operation of the airplane.

4.9 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.

Upon entering the cockpit, release the seat belts securing the control wheel and set the parking brake. Turn ON the master switch and check the fuel quantity gauges for sufficient fuel. After the fuel quantity check is made turn the master switch OFF and check that the ignition switch is OFF.

To begin the exterior walk-around, check for external damage and operational interference of the control surfaces or hinges. Ensure that the wings and control surfaces are free of snow, ice, frost or any other foreign materials.

An operational check of the stall warning system and navigation lights should now be made. Turn the master switch ON. Lift the detector while checking to determine if the horn is actuated and check that the navigation lights are illuminated. The master switch should be returned to the OFF position after the checks are complete.

A visual check of the fuel tank quantity should be performed. Remove the filler cap from each tank and visually check the supply. Be sure to secure the caps properly after the check is complete.

The fuel system sumps and strainer should be drained daily prior to the first flight and after refueling to check for water, sediment, and proper fuel. Each fuel tank is supplied with an individual quick drain located at the lower inboard rear corner of the tank. The fuel strainer is equipped with a quick drain located on the front lower corner of the firewall. Each of the fuel tank sumps should be drained first. Then the fuel strainer should be drained twice, once with the fuel selector valve on each tank. Each time fuel is drained, allow a sufficient amount to flow and be collected in a suitable container, so that it may be examined to ensure removal of water and sediments, and for proper fuel; then discard.

CAUTION

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

Each quick drain should be checked after closing it to make sure it has closed completely and is not leaking.

Check all of the fuel tank vents to make sure they are open.

Next, complete a check of the landing gear. Check the main gear shock struts for proper inflation. There should be 4.50 inches of strut exposure under a normal static load. The nose gear should be checked for 3.25 inches of strut exposure. Check all tires for cuts and wear and ensure proper inflation. Make a visual check of the brake blocks for wear or damage.

Remove the cover from the pitot head on the underside of the left wing. Check the pitot head to make sure the holes are open and clear of obstructions.

Don't forget to clean and check the windshield.

The propeller and spinner should be checked for defects or nicks.

Lift the cowling and check for any obvious fuel or oil leaks. Check the oil level. Make sure that the dipstick has properly seated after checking. Secure the cowling and check the inspection covers.

Check the air inlets for foreign matter and the alternator belt for proper tension.

Stow the tow bar and check the baggage for proper storage and security. The baggage compartment doors should be closed and secure.

Upon entering the aircraft, ascertain that all primary flight controls operate properly. Close and secure the cabin door and check that all the required papers are in order and in the airplane.

Fasten the seat belts and shoulder harness and check the function of the inertia reel by pulling sharply on the strap. Fasten seat belts on empty seats.

4.11 BEFORE STARTING ENGINE

Before starting the engine the parking brake 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.

4.13 STARTING ENGINE

(a) Starting Engine When Cold

Open the throttle lever approximately 1/4 inch. 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 and pressing in. 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 and pressing in. 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 and pressing in. 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 wheel chocks have been removed and propeller back blast and taxi areas are clear. Release the parking brake.

Power should be applied slowly to start the taxi roll. Taxi a few feet forward and apply the brakes to determine the 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 5.0" +/- .1" Hg at 2000 RPM.

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 clear 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. Prior to takeoff the electric pump should be turned ON again to prevent loss of power during takeoff should the engine driven pump fail. 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.