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NORMAL PROCEDURES

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NORMAL PROCEDURES

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NORMAL PROCEDURES

4.1 GENERAL

This section provides the normal operating procedures for the PA-44-180, Seminole airplane. All normal operating procedures required by FAA regulation, as well as those deemed necessary for normal operation of the airplane are presented.

This section provides checklists for all normal operating procedures, using a simple action - reaction format, with little emphasis on system operation. These checklists should be used during normal ground and flight operations.

When appropriate, additional information is provided immediately below the checklist, providing more detailed information related to that procedure. In order to operate the airplane in a safe and efficient manner, pilots should familiarize themselves with the both the checklists and amplified procedures.

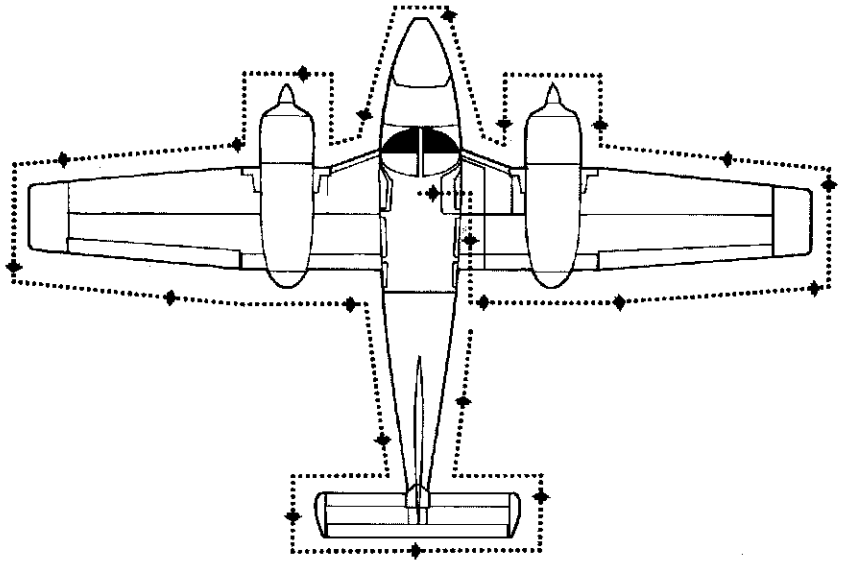
Normal operating procedures associated with optional systems and equipment, which require handbook supplements, are presented in Section 9, Supplements.

4.3 AIRSPEEDS FOR SAFE OPERATIONS

The following airspeeds 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 (Vy) ..... 88 KIAS
(b) Best Angle of Climb Speed (Vx) ..... 82 KIAS
(c) Maximum Operating Maneuvering Speed (Vo) ..... 135 KIAS (115 KIAS @ 2870 LB)
See Airspeed Limitations Section 2.3
(d) Maximum Flap Speed ..... 111 KIAS
(e) Landing Final Approach Speed (Flaps 40 degrees) Short Field Effort ..... 75 KIAS
(f) Intentional One Engine Inoperative Speed (VSSE) ..... 82 KIAS
(g) Maximum Demonstrated Crosswind Velocity ..... 17 KIAS



WALK-AROUND
Figure 4-1

4.5 NORMAL PROCEDURES CHECKLIST

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.

4.5 NORMAL PROCEDURES CHECKLIST (continued)

4.5a Preflight Checklists

COCKPIT

Control Wheel ..... release restraints
Flight Controls ..... FREE AND CORRECT
PARK BRAKE ..... SET
Static System ..... DRAIN
Alternate Static Source ..... CLOSED
LEFT/RIGHT ENG MAG Switches ..... OFF
LEFT/RIGHT FUEL PUMP Switches ..... OFF
GEAR ..... DOWN
THROTTLES ..... IDLE
MIXTURES ..... CUT-OFF
COWL FLAPS ..... OPEN
Stabilator & Rudder Trim ..... NEUTRAL
FUEL Selectors ..... ON
All Electrical Switches ..... OFF
BATT MASTR Switch ..... ON
FUEL QTY Indications ..... CHECK
Gear Position Indications ..... 3 GREEN
BATT MASTR Switch ..... OFF
Emergency Exit ..... CHECK
FLAPS ..... EXTEND
Windows ..... check CLEAN
Required Papers ..... check ON BOARD
POH ..... check ON BOARD
Baggage ..... STOW PROPERLY - SECURE

CAUTION

If the emergency exit is unlatched in flight, it may separate and damage the exterior of the airplane.

Set the parking brake by first depressing and holding the toe brake pedals and then pulling out the PARK BRAKE knob. The static drains are located on the lower left sidewall adjacent to the pilot.

4.5 NORMAL PROCEDURES CHECKLIST (continued)

4.5a Preflight Checklists (continued)

RIGHT WING

Fuel Sump Drains	DRAIN
Surface Condition	CLEAR of ICE, FROST & SNOW
Flap and Hinges	CHECK
Aileron, Hinges & Freedom of Movement	CHECK
Static Wicks	CHECK
Wing Tip and Lights	CHECK
Scupper Drain	CLEAR
Fuel Tank Vent	CLEAR
Tie Down	REMOVE
Nacelle Fuel Filler Cap	CHECK & SECURE
Engine Oil & Cap	CHECK & SECURE
Propeller & Spinner	CHECK
Air Inlets	CLEAR
Cowl Flap Area	CHECK
Main Gear Strut	PROPER INFLATION (2.60 ±0.25 in.)
Main Wheel Tire	CHECK
Brake, Block & Disc	CHECK
Chock	REMOVE

Eight quarts of oil are required for maximum range flights.

4.5a Preflight Checklists (continued)

NOSE SECTION

General Condition	CHECK
Windshield	CLEAN
Battery Vents	CLEAR
Landing Lights	CHECK
Heater Air Inlet	CLEAR
Chock	REMOVE
Nose Gear Strut	PROPER INFLATION (2.70 +/- 0.25 in.)
Nose Wheel Tire	CHECK

LEFT WING

Surface Condition	CLEAR of ICE, FROST & SNOW
Main Gear Strut	PROPER INFLATION (2.60 +/- 0.25 in.)
Main Wheel Tire	CHECK
Brake, Block & Disc	CHECK
Chock	REMOVE
Cowl Flap Area	CHECK
Nacelle Fuel Filler Cap	CHECK & SECURE
Engine Oil & Cap	CHECK & SECURE
Propeller & Spinner	CHECK
Air Inlets	CLEAR
Scupper Drain	CLEAR
Fuel Tank Vent	CLEAR
Tie Down	REMOVE
Stall Warning Vanes	CHECK
Pitot/ Static Head	CLEAR
Wing Tip and Lights	CHECK
Aileron, Hinges & Freedom of Movement	CHECK
Flap and Hinges	CHECK
Static Wicks	CHECK

Eight quarts of oil are required for maximum range flights.

4.5a Preflight Checklists (continued)

FUSELAGE (LEFT SIDE)

General Condition ..... CHECK
Emergency Exit ..... CHECK
Antennas ..... CHECK
Fresh Air Inlet ..... CLEAR

EMPENNAGE

Surface Condition ..... CLEAR of ICE, FROST & SNOW
Stabilator, Trim Tab & Freedom of Movement ..... CHECK
Rudder, Trim Tab & Freedom of Movement ..... CHECK
Static Wicks ..... CHECK
Tie Down ..... REMOVE

FUSELAGE (RIGHT SIDE)

General Condition ..... CHECK
Baggage Door ..... CLOSED AND LATCHED
Cabin Door ..... CHECK

MISCELLANEOUS

FLAPS ..... RETRACT
BATT MASTR Switch ..... ON
Interior Lighting (Night Flight) ..... ON & CHECK

CAUTION

Care should be taken when checking the heated pitot head. The unit becomes very hot. Ground operation should be limited to 3 minutes maximum to avoid damaging the heating elements.

PITOT HEAT Switch ..... ON
Exterior Lighting Switches ..... ON & CHECK
Pitot/Static Head ..... CHECK - WARM
PITOT HEAT Switch ..... OFF
All Lighting Switches ..... OFF
BATT MASTR Switch ..... OFF
Passengers ..... BOARD

4.5b Before Starting Engine Checklists

BEFORE STARTING ENGINE

Preflight Check ..... COMPLETED
Flight Planning ..... COMPLETED
Cabin Door ..... CLOSE & LATCH (Lower then Upper)
Seats ..... ADJUSTED & LOCKED
Seatbelts and Harness ..... FASTEN/ADJUST
CHECK INERTIA REEL
PARK BRAKE ..... SET
GEAR ..... DOWN
THROTTLES ..... IDLE
PROPELLERS ..... FULL INCREASE
MIXTURES ..... CUT-OFF
Friction Handle ..... AS DESIRED
ALT-AIR ..... CLOSE
COWL FLAPS ..... OPEN
Stabilator & Rudder Trim ..... SET
FUEL Selectors ..... ON
LEFT/RIGHT ALTR Switches .... ON (OFF, if external power connected)
EMERG BATT ..... ARM
E VOLTS Indication ..... 23.3 VOLTS (minimum)
AVION MASTER Switch ..... OFF
STROBE LIGHTS ..... FIN STROBE
All Other Electrical Switches ..... OFF
CABIN HEAT Switch ..... OFF
Circuit Breakers ..... CHECK
Proceed with appropriate Engine Start Checklist.

NOTE

The EMERG BATT should remain ON after checking for proper bus operation, allowing the PFD to remain powered for engine start. Avoid delays between this check and engine starting to preserve emergency battery power.

If the E VOLTS indication is less than 23.3 VOLTS, the voltage should be checked again at the end of the GROUND CHECK checklist (after being charged for some time by the primary electrical system). If E VOLTS is still less than 23.3 volts, determine the cause and correct the issue prior to flight.

4.5c Engine Start Checklists

ENGINE START - GENERAL

WARNING

The L START ENGD or R START ENGD warning CAS message will illuminate after 30 seconds of continuous engine cranking. If the CAS message illuminates after the engine is running, stop the engine and determine the cause.

NOTE

When starting at ambient temperatures +20°F and below, operate first engine started with alternator ON (at max charging rate not to exceed 1500 RPM) for 5 minutes minimum before initiating start on second engine.

NOTE

Starter manufacturer recommends starter cranking periods be limited to 10 seconds with a 20 second rest period between cranking attempts. Maximum of 6 start periods allowed. If a start is not achieved on sixth attempt allow starter to cool for 30 minutes before attempting additional starts. Do not engage the starter immediately after releasing it. This practice may damage the starter mechanism.

4.5c Engine Start Checklists (continued)

NORMAL START - COLD ENGINE

BATT MASTR Switch ..... ON
Gear Position Indications ..... 3 GREEN
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
THROTTLES ..... 1/4 inch OPEN
PROPELLERS ..... FULL INCREASE
*FUEL PUMP ..... ON
*MAG LEFT/RIGHT Switches ..... ON
*MIXTURE ..... PRIME - then CUT-OFF
*Propeller Area ..... CLEAR
*ENG START ..... ENGAGE
*MIXTURE ..... ADVANCE
*THROTTLE ..... ADJUST WHEN ENGINE STARTS TO 1000 RPM
*OIL PSI ..... CHECK

Repeat above procedure (*) for second engine start
VOLTS ..... CHECK
ALTR AMPS ..... CHECK
FUEL PUMPS ..... OFF

When the engine starts, adjust the throttle and monitor the oil pressure. If no oil pressure is indicated within 30 seconds, shut down the engine and have it checked. In cold weather it may take somewhat longer for an oil pressure indication.

4.5c Engine Start Checklists (continued)

NORMAL START - HOT ENGINE

BATT MASTR Switch ..... ON
Gear Position Indications ..... 3 GREEN
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
THROTTLES ..... 1/2 inch OPEN
PROPELLERS ..... FULL INCREASE
*MIXTURE ..... CUT-OFF
*FUEL PUMP ..... ON
*MAG LEFT/RIGHT Switches ..... ON
*Propeller Area ..... CLEAR
*ENG START ..... ENGAGE
*MIXTURE ..... ADVANCE
*THROTTLE ..... ADJUST to LOW RPM
*OIL PSI ..... CHECK

If engine does not start, add small amount of prime and repeat above.

Repeat above procedure (*) for second engine start
VOLTS ..... CHECK
ALTR AMPS ..... CHECK
FUEL PUMPS ..... OFF

4.5c Engine Start Checklists (continued)

ENGINE START - COLD WEATHER (BELOW 10°F)

WARNING

Ensure all magneto (MAG LEFT/RIGHT) and master switches (BATT MASTR) are OFF and mixture controls are in cut-off before turning propeller manually.

If available, preheat should be considered. Rotate each propeller through 10 blades manually during preflight inspection.

BATT MASTR Switch ..... OFF
LEFT/RIGHT ALTR Switches ..... VERIFY OFF
External Power (24-28 VDC source) ..... CONNECT
Gear Position Indications ..... 3 GREEN
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
THROTTLES ..... 1/4 inch OPEN
PROPELLERS ..... FULL INCREASE
*FUEL PUMP ..... ON
*MAG LEFT/RIGHT Switches ..... ON
*MIXTURE ..... PRIME - then CUT-OFF
*Propeller Area ..... CLEAR
*ENG START ..... ENGAGE
*MIXTURE ..... ADVANCE
*OIL PSI ..... CHECK

If engine does not start, add prime and repeat above.

Repeat above procedure (*) for second engine start
THROTTLES ..... LOWEST POSSIBLE RPM
BATT MASTR Switch ..... ON
External Power ..... DISCONNECT
LEFT/RIGHT ALTR Switches ..... ON
VOLTS ..... CHECK
ALTR AMPS ..... CHECK
FUEL PUMPS ..... OFF

4.5c Engine Start Checklists (continued)

ENGINE START - COLD WEATHER (BELOW 10°F) (continued)

After engine start and the throttle is set as desired, the oil pressure should be checked for a positive indication. If no oil pressure is indicated within 30-seconds, shut down the engine and have it checked. In cold weather it may take somewhat longer for an oil pressure indication.

NOTE

When starting at ambient temperatures +20°F and below, operate first engine started with alternator ON (not to exceed 1500 RPM) for 5 minutes minimum before initiating start on second engine.

ENGINE START WHEN FLOODED

BATT MASTR Switch ..... ON
Gear Position Indications ..... 3 GREEN
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
THROTTLES ..... OPEN FULL
PROPELLERS ..... FULL FORWARD
MIXTURES ..... CUT-OFF
*FUEL PUMP ..... OFF
*MAG LEFT/RIGHT Switches ..... ON
*Propeller Area ..... CLEAR
*ENG START ..... ENGAGE
*MIXTURE ..... ADVANCE
*THROTTLE ..... RETARD
*OIL PSI ..... CHECK

Repeat above procedure (*) for second engine start

VOLTS ..... CHECK
ALTR AMPS ..... CHECK
FUEL PUMPS ..... OFF

4.5c Engine Start Checklists (continued)

ENGINE START WITH EXTERNAL POWER SOURCE

BATT MASTR Switch ..... OFF
ALTR LEFT/RIGHT ..... VERIFY OFF

NOTE

The EMERG BATT switch may remain in ARM while using external power. The emergency bus does not receive power from external power.

External Power (24-28 VDC source) ..... CONNECT
Gear Position Indications ..... 3 GREEN
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
THROTTLES ..... 1/4 inch OPEN
PROPELLERS ..... FULL INCREASE
*FUEL PUMP ..... ON
*MAG LEFT/RIGHT Switches ..... ON
*MIXTURE ..... PRIME - then CUT-OFF
*Propeller Area ..... CLEAR
*ENG START ..... ENGAGE
*MIXTURE ..... ADVANCE
*THROTTLE ..... ADJUST WHEN ENGINE STARTS TO 1000 RPM
*OIL PSI ..... CHECK

Repeat above procedure (*) for second engine start

THROTTLES ..... LOWEST POSSIBLE RPM
BATT MASTR Switch ..... ON
External Power ..... DISCONNECT
ALTR LEFT/RIGHT Switches ..... ON
VOLTS ..... CHECK
ALTR AMP ..... CHECK
FUEL PUMPS ..... OFF

4.5d Warm-Up Checklist

WARM-UP

THROTTLES ..... 1000 to 1200 RPM

BEFORE TAXIING

External Power Source ..... VERIFY REMOVED
BATT MASTR Switch ..... VERIFY ON
FUEL Selectors ..... ON, BOTH XFEED (30 SEC), ON
AVION MASTER Switch ..... ON
MFD splash screen ..... Verify Database Currency
FUEL Totalizer ..... FOB SYNC or ENTER MANUALLY
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
System Messages (Messages Softkey) ..... Consider
TRAFFIC (if installed) ..... TEST
ANN Test Softkey ..... PRESS

CAUTION

Adjust headset volume to hear the STALL..STALL voice alert at an acceptable level. This will ensure all aural alerts and tones will be audible through the headset.

Standby Flight Instrument ..... VERIFY ON with no red X's or failure annunciations
Altimeters (Standby and PFD) ..... SET
Lights ..... AS REQUIRED
CABIN HEAT ..... AS DESIRED
Radios ..... CHECK & SET
Autopilot ..... Verify Preflight Self-Test (PFT) completed and disconnect tone heard.
FUEL Selectors ..... VERIFY ON
Passenger Briefing ..... COMPLETE
PARK BRAKE ..... RELEASE

To test the traffic system (if installed), the ADS-B softkey on the Map - Traffic Map page on the MFD must be selected off. The ANN Test softkey is located on the Aux-System Status page of the MFD.

4.5e Taxiing Checklist

TAXIING

Taxi Area.....CLEAR
THROTTLES.....APPLY SLOWLY
Brakes.....CHECK
Steering.....CHECK
Instruments.....CHECK

NOTE

During taxi, if the VOLTS indication decreases into the warning range, increase engine RPM (if possible) to retain adequate battery charging.

4.5f Ground Check Checklist

GROUND CHECK

PARK BRAKE.....SET
MIXTURES.....FULL RICH
PROPELLERS.....FULL INCREASE
Engine Instruments.....CHECK
THROTTLES.....1500 RPM
PROPELLERS (Max. Drop - 500 RPM).....FEATHER - CHECK
THROTTLES.....2000 RPM
LEFT/RIGHT MAG (Max. Drop - 175 RPM:
Max. Diff. - 50 RPM).....CHECK
ALT-AIR.....CHECK
THROTTLES.....2200 RPM
PROPELLERS (Max. Drop - 300 RPM).....EXERCISE
THROTTLES (550 to 650 RPM).....IDLE - CHECK
FUEL PUMPS.....ON
THROTTLES.....1000 RPM
Friction Handle.....SET

4.5f Ground Check Checklist (continued)

If E VOLTS indication less than 23.3 VOLTS during BEFORE STARTING ENGINE checklist:

EMERG BATT Switch ..... Verify ARM
AVION MASTER Switch ..... OFF
ALTR LEFT / RIGHT Switches ..... OFF
BATT MASTR Switch ..... OFF
E VOLTS Indication .....23.3 VOLTS MINIMUM

If E VOLTS less than 23.3 VOLTS, determine cause and correct issue prior to flight.

If E VOLTS greater than or equal to 23.3 VOLTS:

BATT MASTR Switch ..... ON
ALTR LEFT / RIGHT Switches ..... ON
AVION MASTER Switch ..... ON

Operation of an engine on one magneto should be kept to a minimum.

4.5f Ground Check Checklist (continued)

The governor can be checked by retarding the propeller control until a drop of 100 RPM to 200 RPM appears, then advancing the throttle to get a slight increase in manifold pressure. The propeller speed should stay the same when the throttle is advanced, indicating proper function of the governor.

Alternate air should also be checked prior to takeoff to be sure the control is operating properly. Avoid prolonged ground operation with alternate air OPEN as the air is unfiltered.

4.5g Before Takeoff Checklist

BEFORE TAKEOFF

Flight Controls ..... FREE and CORRECT
Flight Instruments ..... CHECK
Engine Instruments ..... CHECK
FUEL QTY ..... SUFFICIENT
PROPELLERS ..... FULL INCREASE
MIXTURES ..... FULL RICH
ALT-AIR ..... CLOSE
COWL FLAPS ..... OPEN
FLAPS ..... CHECK & SET
Stabilator and Rudder Trims ..... SET
FUEL Selectors ..... ON
CAS Messages ..... CONSIDER ANY ILLUMINATED
PFD Annunciations ..... CONSIDER ANY ILLUMINATED
System Messages (Messages Softkey) ..... Consider
Transponder ..... AS REQUIRED
FUEL PUMPS ..... ON
PITOT HEAT ..... AS REQUIRED
STROBE LIGHTS ..... ON
Door ..... LATCHED (Lower then Upper)
PARK BRAKE ..... RELEASE

CAUTION

Prior to takeoff with autopilot on, verify that the autopilot servos are disengaged and that flight controls move freely.

4.5h Takeoff Checklist

CAUTION

Fast taxi turns immediately prior to takeoff should be avoided to prevent unporting fuel feed lines.

NOTE

Adjust mixture prior to takeoff at high elevations. Do not overheat engines. Adjust mixture only enough to obtain smooth engine operation.

NORMAL TAKEOFF

FLAPS	0° to 10°
Stabilator and Rudder Trim	CHECK SET
Power	2700 RPM, FULL THROTTLE
Rotate Speed	75 KIAS
Climb Speed	88 KIAS
GEAR	UP
FLAPS	UP

NOTE

TAS aural alerts will be muted when GPS altitude is lower than ~ 400 FT AGL.

Takeoff should not be attempted with ice or frost on the wings. Takeoff distances and 50-foot obstacle clearance distances are shown on charts in the Performance Section of this Handbook. The performance shown on charts will be reduced by uphill gradient, tailwind component, soft, wet, rough or grassy surface, or poor pilot technique.

4.5h Takeoff Checklist (continued)

0° FLAP, SHORT FIELD PERFORMANCE TAKEOFF

FLAPS ..... UP
Stabilator and Rudder Trim ..... CHECK SET
Brakes ..... HOLD
Power ..... 2700 RPM, FULL THROTTLE
MIXTURE ..... FULL RICH (or SET for ALTITUDE)
Brakes ..... RELEASE
Rotate Speed ..... 70 KIAS
Obstacle Clearance Speed ..... 82 KIAS
GEAR (with positive rate of climb) ..... UP
Climb Speed (past obstacles) ..... 88 KIAS

NOTE

Gear warning horn will sound when landing gear is retracted with flaps extended beyond first notch.

When a short field effort is required, the safest technique is to use flaps up (0°). In the event of an engine failure, the airplane will be in the best configuration to maintain altitude immediately after the gear is raised. Refer to Section 5 of this handbook for short field performance data.

4.5i Climb Checklist

MAXIMUM PERFORMANCE CLIMB

Best Rate (Flaps Up) ..... 88 KIAS
Best Angle (Flaps Up) ..... 82 KIAS
COWL FLAPS ..... OPEN
FUEL PUMPS ..... ON

4.5i Climb Checklist (continued)

CRUISE CLIMB (4.25b)

MIXTURE.....FULL RICH
Power 75%
Climb Speed .....105 KIAS
COWL FLAPS .....As Required
FUEL PUMPS.....ON

After attaining an altitude for adequate terrain and obstacle clearance, a cruise climb speed of 105 KIAS or higher is recommended. The combination of reduced power and increased climb speed provides better engine cooling, less engine wear, reduced fuel consumption, lower cabin noise level, and better forward visibility. When reducing engine power, the throttles should be retarded first, followed by the propeller controls. Consistent operational use of cruise climb power settings is strongly recommended since this practice will make a substantial contribution to fuel economy, increased engine life, and will reduce the incidence of premature engine overhauls.

4.5j Cruise Checklist

CRUISING

Reference performance charts and Lycoming Operator's Manual.
Power.....SET per Power Setting Chart
FUEL PUMPS.....OFF
MIXTURES .....ADJUST
COWL FLAPS.....As Required
TRIM.....As Required

WARNING

Flight in icing conditions is prohibited. If icing is encountered, select alternate air and take immediate action to exit icing conditions. Ensure PITOT HT is ON. Monitor engines and select ALT-AIR OPEN if roughness or power loss is experienced. Icing is hazardous due to greatly reduced performance, loss of forward visibility, possible longitudinal control difficulties and impaired power plant and fuel system operation.

4.5j Cruise Checklist (continued)

CRUISING (continued)

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, pull the mixture control aft.

Best economy mixture is obtained by moving the mixture control aft until peak EGT is reached. Performance Cruise mixture is obtained by leaning to peak EGT and then enrichening until the EGT is 125°F 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.

For maximum service life, cylinder head temperature should be maintained below 435°F during high performance cruise operation and below 400°F during economy cruise operation. If cylinder head temperatures become too high during flight, reduce them by enriching the mixture, by opening cowl flaps, by reducing power, or by use of any combination of these methods.

The pilot should monitor weather conditions while flying and should be alert to conditions which might lead to icing. If induction system icing is expected, place the ALT-AIR control in the OPEN position.

The LEFT ALTR amd RIGHT ALTR switches should be ON for normal operation. Certain regulator failures can cause the alternator output voltage to increase uncontrollably. To prevent damage, overvoltage relays will automatically shut off the alternator(s). The CAS Warning messages L ALTR FAIL and R ALTR FAIL will warn of this tipped condition.

Alternator outputs will vary with the electrical equipment in use and the state of charge of the battery. ALTR AMPS should not exceed 60 amperes on the ground or 65 amperes in flight. The VOLTS indication will flash red if bus voltage drops below minimum requirements.

IFR operation is not recommended with a single alternator.

4.5j Cruise Checklist (continued)

CRUISING (continued)

Since the Seminole has one fuel tank per engine, it is advisable to feed the engines symmetrically during cruise so that the same approximate amount of fuel will be left in each side for the landing. The crossfeed (XFEED) can be used to balance FUEL QTY, if necessary.

During flight, keep account of time and fuel used in connection with power settings to verify the accuracy of the fuel flow and fuel quantity gauging systems.

There are no mechanical uplocks in the landing gear system. If the hydraulic system malfunctions, the landing gear will free-fall to the gear down position. True airspeed with gear down is approximately 75% of the gear retracted airspeed for any given power setting. Allowances for the reduction in airspeed and range should be made when planning extended flight between remote airfields or flight over water.

4.5k Descent Checklist

DESCENT

MIXTURE.....ADJUST with Descent
THROTTLES.....As Required
COWL FLAPS.....As Required

When power is reduced for descent, the mixtures should be enriched as altitude decreases. The propellers may be left at cruise setting; however, if the propeller speed is reduced, it should be done after the throttles have been retarded. Cowl flaps should normally be closed to keep the engines at the proper operating temperature.

4.51 Approach and Landing Checklist

APPROACH AND LANDING

Seat Backs ..... ERECT
Seat Belts, Harnesses ..... ADJUSTED
FUEL PUMPS ..... ON
FUEL Selectors ..... ON
GEAR (Below 140 KIAS) ..... DOWN
Gear Position Indications ..... 3 GREEN
Nacelle Mirror ..... CHECK NOSE GEAR DOWN
MIXTURES ..... FULL RICH
PROPELLERS ..... FULL INCREASE
ALT-AIR ..... AS REQUIRED
Autopilot ..... Disconnect (above 200 FT AGL)

NOTE

TAS aural alerts will be muted when GPS altitude is lower than ~ 400 FT AGL.

NOTE

The HSI will auto-slew during CDI transitions to LOC, LOC BC, LDA, or SDF approaches if the approach is activated in the G1000 system. The pilot should always double check the inbound course pointer prior to initiating a VHF NAV approach.

During the approach for a landing, the CHECK GEAR aural alert may sound. The mutable CHECK GEAR is triggered when the gear is not down and locked and manifold pressure(s) is less than 14 in Hg. The non-mutable CHECK GEAR is triggered when the landing gear is not down and locked and flaps are extended beyond the first notch. The severity of the CHECK GEAR CAS message is determined by proximity to the ground. A Caution message is triggered when above ~400 feet AGL, and a Warning is triggered below ~400 feet AGL. See Section 7 for additional details.

The landing gear is down and locked when three solid green circles are indicated on the MFD. The mirror on the left engine nacelle may be used to visually verify the nose landing gear position.

Operate the toe brakes to verify sufficient pressure for normal braking. Verify the parking brake is not set.

4.51 Approach and Landing Checklist (continued)

NORMAL LANDING

FLAPS	0° to FULL DOWN
Airspeed (Flaps Up)	80-90 KIAS
(Flaps Down)	75-85 KIAS
Trim	AS REQUIRED
THROTTLES	AS REQUIRED
Touchdown	MAIN WHEELS
Braking	AS REQUIRED

Landing may be made with any flap setting. Normally full flaps are used, which reduces stall speed and permits slower speed at contact. Maximum braking after touch-down is achieved by retracting the flaps, applying back pressure to the wheel and applying pressure on the brakes. However, unless maximum braking is needed or unless a strong crosswind or gusty condition exists, it is best to wait until turning off the runway to retract the flaps. This will permit full attention to be given to the landing and landing rollout.

If a crosswind or high-wind landing is necessary, approach with higher than normal speed and with zero to 25 degrees of flaps. Immediately after touch-down, raise the flaps. During a crosswind approach hold a crab angle into the wind until ready to flare out for the landing. Then lower the wing that is into the wind to eliminate the crab angle without drifting, and use the rudder to keep the wheels aligned with the runway. Avoid prolonged side slips with a low fuel indication.

NOTE

The maximum demonstrated crosswind component during landing is 17 KTS.

4.5l Approach and Landing Checklist (continued)

SHORT FIELD PERFORMANCE LANDING

FLAPS (Below 111 KIAS)..... FULL DOWN
Airspeed (At Max. Weight)..... 75 KIAS
Trim..... AS REQUIRED
THROTTLES.....IDLE
Touchdown.....MAIN WHEELS
Braking..... MAXIMUM without SKIDDING

For landings on short runways or runways with adjacent obstructions, a short field landing technique should be used in accordance with the charts in Section 5. The airplane should be flown down final with full flaps, at 75 KIAS (at maximum weight) so as to cross any obstructions with the throttles at idle. Immediately after touch-down, raise the flaps and apply back pressure to the control wheel as maximum braking is applied.

4.5m Go-Around Checklist

GO-AROUND

MIXTURES ..... FULL RICH
PROPELLERS ..... FULL INCREASE
THROTTLES ..... FULL OPEN
Control Wheel ..... BACK PRESSURE TO OBTAIN POSITIVE CLIMB ATTITUDE
FLAPS ..... RETRACT INCREMENTALLY
GEAR ..... UP
COWL FLAPS ..... AS REQUIRED

WARNING

Autopilot coupled go-around is not authorized during single engine operations.

If the aircraft is equipped with optional Underspeed Protection (USP) and an autopilot coupled go-around is desired, press the TO/GA button on the throttle handle, followed immediately by the checklist shown above. Refer to Section 7 for additional details on the autopilot coupled go-around.

4.5n After Landing Checklist

AFTER LANDING

Clear of runway.
FLAPS ..... RETRACT
COWL FLAPS ..... FULL OPEN
ALT-AIR ..... CLOSE
FUEL PUMPS ..... OFF
LIGHTS ..... AS REQUIRED
PITOT HEAT ..... OFF

A spongy pedal during braking, is often an indication that the brake fluid needs replenishing.

4.5o Stopping Engine Checklist

STOPPING ENGINE

CABIN HEAT (If ON) ..... FAN - 2 MIN. THEN OFF
VENT FAN ..... OFF
AVION MASTER ..... OFF
EMERG BATT ..... OFF
LEFT/RIGHT ALTR ..... OFF
LEFT/RIGHT FUEL PUMP ..... OFF
All Other Electrical Equipment ..... OFF
THROTTLES ..... IDLE
MIXTURES ..... CUT-OFF
LEFT/RIGHT ENG MAG Switches ..... OFF
Interior Lights (at night) ..... OFF
Exterior Lights ..... OFF
BATT MASTR ..... OFF
STANDBY INSTRUMENT ..... VERIFY SHUTDOWN

NOTE

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

NOTE

In case the standby instrument remains "ON" due to improper shutdown, the unit switches to internal battery and depletes it. To turn off the Aspen EBD, press the "SHUT DOWN" command from Main Menu page 6 or hold the red "REV" button for 20 seconds. To turn off the Garmin G5, press and hold the power button for five seconds.

4.5p Mooring Checklist

MOORING

PARK BRAKE ..... AS REQUIRED
Control Wheel ..... SECURED with seat belts
FLAPS ..... FULL UP
Wheel Chocks ..... IN PLACE
Tiedowns ..... SECURE

If necessary, the airplane should be moved on the ground with the aid of the optional nose wheel tow bar.

The ailerons and stabilator should be secured by looping the seat belt through the control wheel and pulling it snug. The rudder need not be secured under normal conditions, as its connection to the nose wheel holds it in position. The flaps are locked when in the fully retracted position. Wheel chocks should be positioned in place, or the parking brake set. Tie-down ropes may be attached to mooring rings under each wing and to the tail skid.

4.5q VSSE - Intentional One Engine Inoperative Speed

VSSE is not a limitation. However, it is recommended that, except for training, demonstrations, takeoffs, and landings, the airplane should not be flown at a speed slower than VSSE.

The intentional one-engine inoperative speed, Vsse, for the PA-44-180 is 82 KIAS.

4.5r VMCA - Air Minimum Control Speed

The VMCA demonstration, may be required for the FAA flight test for the multi-engine rating.

VMCA DEMONSTRATION

(a) Landing Gear ..... UP
(b) Flaps ..... UP
(c) Altitude ..... at or above 4000 ft. AGL
(d) Airspeed ..... at or above 82 KIAS (Vsse)
(e) Mixture ..... FULL RICH
(f) Propeller Controls ..... HIGH RPM
(g) Throttle (Simulated Inoperative Engine) ..... IDLE
(h) Throttle (Other Engine) ..... FULL FORWARD
(i) Airspeed ..... Reduce approximately 1 knot per second until either STALL WARNING, FULL CONTROL TRAVEL or VMCA is obtained

CAUTION

Use rudder to maintain directional control (heading) and ailerons to maintain 5° bank towards the operative engine (lateral attitude). At the first sign of either VMCA (airspeed indicator redline) or stall warning (which may be evidenced by: inability to maintain heading or bank attitude, aerodynamic stall buffet, or stall warning horn), immediately initiate recovery; reduce power to idle on the operative engine, and immediately lower the nose to regain VMCA and continue accelerating to VSSE.

CAUTION

One engine inoperative stalls are not recommended.

Under no circumstances should an attempt be made to fly at a speed below VMCA with only one engine operating.

4.5s Practice One Engine Inoperative Flight

Simulated one engine inoperative flight can be practiced without actually shutting down one engine by setting the propeller rpm of an engine to approximate zero thrust. This is accomplished at typical training altitudes with the throttle adjusted to produce the appropriate engine speed shown below and the mixture full rich, or leaned as required for smooth low power operation.

CAUTION

A rapid reduction in power (full throttle to idle in less than 2 seconds) may be harmful to the engine.

Propeller rpm for Zero Thrust

KIAS	RPM
82 VSSE	1850
88 VYSE	2180
100	2510
110	2690

4.5t Noise Level

The corrected noise levels for this aircraft are as follows:

Propeller Designation	14 CFR Part 36	ICAO Annex 16
Straight Blade HC-C2Y(K,R)-2CEUF/FC7666A-2R HC-C2Y(K,R)-2CLEUF/FJC7666A-2R	74.7 dB(A) (Amdt. 36-4)	74.7 dB(A) (Vol I, Part II, Ch 6)
Scimitar Blade HC-C2YR-2CEUFP/FC7497 HC-C2YR-2CLEUFP/FJC7497	82.4 dB(A) (Amdt. 36-28)	82.4 dB(A) (Vol I, Ch 10)

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 14 CFR Part 36 - Noise Standards: Aircraft Type and Airworthiness Certification. This aircraft model is in compliance with all 14 CFR Part 36 noise standards applicable to this type.

4.5u Stalls

The loss of altitude during a power off stall with the gear and flaps retracted may be as much as 300 feet.

NOTE

The stall warning system is inoperative with the Battery Master OFF