SECTION 4 - NORMAL PROCEDURES

PA-30 * 3600 LBS GROSS WEIGHT

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NORMAL PROCEDURES

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AIRSPEEDS FOR SAFE OPERATION

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

V_A - Design Maneuvering Speed / Turbulent Air Penetration Speed	162 mph	141 kt
V_{APP} - Final Approach to Landing Speed	95 mph	83 kt
V_{FE} - Flap Extension Speed	125 mph	108 kt
V_{FE} - Recommended	100 mph	87 kt
V_{LO} - Landing-Gear Operation Speed	150 mph	130 kt
V_{LO} - Recommended	125 mph	108 kt
V_{MCA} - Single Engine Minimum Control Speed	90 mph	78 kt
V_{NE} - Never Exceed Speed	230 mph	200 kt
V_R - Rotation Speed (W/Zero Degrees of Flap)	90 mph	78 kt
V_{S0} - Stall Speed (Power Off - Full Flaps and Gear Extended)	69 mph	60 kt
V_{S1} - Stall Speed (Power Off - Clean)	76 mph	66 kt
V_{SSE} - Minimum Intentional Single Engine Speed	97 mph	84 kt
V_X - Best Angle-of-Climb Speed (At Sea Level)	90 mph	78 kt
V_{XSE} - Best Single Engine Angle-of-Climb Speed	94 mph	82 kt
V_Y - Best Rate-of-Climb Speed (At Sea Level)	112 mph	97 kt
V_{YSE} - Best Single Engine Rate-of-Climb Speed	105 mph	91 kt
Best En Route Rate-of-Climb Speed	130 mph	113 kt
Demonstrated Crosswind Component	20 mph	17 kt

NOISE ABATEMENT

Environmental concerns require that measures be taken to minimize the effect of airplane noise around airports or when operating near the ground. The following is a general guideline.

Many airports have published noise-abatement procedures. Pilots should become familiar with these procedures and conform to them. Pilots should also avoid noise-sensitive areas such as recreational and residential areas.

VFR departure from, and approach to an airport should be made so as to avoid prolonged flight at an altitude lower than 2,000 ft AGL. This procedure would only apply where weather permits. Other factors such as conflict with instructions from Air Traffic Control or the pilot's responsibility to see and avoid other aircraft will override this procedure.

No determination has been made by the Federal Aviation Administration as to whether the noise level of the Comanche is or should be acceptable by any standard for operation at, into, or out of any airport.

PREFLIGHT CHECK

1.) Cabin:

Control Wheel ..... Release Restraint
Avionics Master (Or Radios) ..... Check Off
Ignition ..... Check Off
Landing Gear Selector ..... Down
Master Switch ..... On
Fuel Quantity Gauge ..... Check Each Tank
Wing Flaps ..... Lower
Master Switch ..... Off
Oxygen Quantity (If Equipped and Required) ..... Adequate
Required Papers and Navigation Charts ..... On Board

WALK AROUND INSPECTION

Exterior ..... Check for Damage and Evidence of Fluid Leaks

2.) Right Wing:

Control Surfaces ..... Check for Interference
Wing Tip and Navigation Light ..... Check
Fuel Tanks ..... Check Supply Visually - Adjust and Secure Caps
Fuel Tank Vents and Overflow Drains ..... Open
Tie Down and Wheel Chock ..... Remove
Main Gear Strut ..... Proper Inflation 2-3/4 in
Tire ..... Check for Wear and Proper Inflation
Oil ..... Check Level
Dip Stick and Oil Inspection Cover ..... Secure
Air Inlets ..... Clear
Propeller ..... Check for Nicks
Area Around Propeller ..... Clear of Debris
Cowling ..... Secure

3.) Nose Section:

Windshield ..... Clean
Heater and Ventilating Air Inlet ..... Clear
Nose Gear Strut ..... Proper Inflation 2-3/4 in
Tire ..... Check for Wear and Proper Inflation

4.) Left Wing:

Oil ..... Check Level
Dip Stick and Oil Inspection Cover ..... Secure
Air Inlets ..... Clear
Propeller ..... Check for Nicks
Area Around Propeller ..... Clear of Debris

WALK AROUND INSPECTION (Cont.)

4.) Left Wing:(Cont.)

Cowling ..... Secure
Fuel Tanks ..... Check Supply Visually - Adjust and Secure Caps
Fuel Tank Vents and Overflow Drains ..... Open
Tie Down and Wheel Chock ..... Remove
Main Gear Strut ..... Proper Inflation 2-3/4 in
Tire ..... Check for Wear and Proper Inflation
Stall Warning Transmitter Switch ..... Free
Pitot Head ..... Cover Removed - Hole Clear
Wing Tip and Navigation Light ..... Check
Control Surfaces ..... Check for Interference

5.) Fuselage and Empennage:

Static Vents ..... Holes Clear
Control Surfaces ..... Check for Interference
Navigation Lights ..... Check
Antennas ..... Check
Dorsal Fin Ventilating Air Inlet ..... Clear
Tie Down ..... Remove
Baggage Door ..... Secure

** **WARNING** ** In winter insure that all surfaces are free of ice, frost and snow.

PREFLIGHT CHECK FOR NIGHT OPERATION

If operation of aircraft extends into night:

Master Switch ..... On
Navigation and Landing Lights ..... Check
Panel and Cabin Lights ..... Check
Master Switch ..... Off
Flashlight ..... On Board

BEFORE STARTING ENGINES

Seats ..... Erect
Belts and Harness ..... Fastened and Adjusted
Brakes ..... Set
Fuel Strainers ..... Drain Sample (5 Seconds) and Check Each Tank
Fuel Selectors ..... Inboard Main Tanks
Circuit Breakers ..... Check In
Avionics Master (Or Radios) ..... Check Off
Generator Switches (If Equipped with Generators) ..... Check On
Air Vents, Heater and Defroster ..... As Desired
Alternate Static Source (If Installed) ..... Closed
Controls ..... Free and Correct
Door ..... Latched
Cowl Flaps ..... Open

STARTING ENGINES WHEN COLD

Throttle ..... 1/2 in Open
Propeller Control ..... Full Forward - Increase rpm
Master Switch ..... On
Electric Fuel Pump ..... On
Mixture ..... Full Rich
Fuel Flow Meter ..... Indicates 5 gpm Flow (Engine is Primed)
Mixture ..... Idle Cut-Off

** CLEAR PROP **

Magneto Switches ..... On
Starter ..... Engage (Maximum 15 Seconds)
Mixture ..... Advance Slowly to Full Rich
Throttle ..... Adjust
Oil Pressure ..... Check

**** CAUTION ****

If oil pressure is not indicated within 30 seconds, stop engine and determine cause of trouble.

Repeat Procedure for Opposite Engine.

STARTING ENGINES WHEN HOT

Throttle ..... Full Forward - Open
Propeller Control ..... Full Forward - Increase rpm
Master Switch ..... On
Electric Fuel Pump ..... On
Mixture ..... Full Rich to Purge Lines - Then Idle Cut-Off
Electric Fuel Pump ..... Off

** CLEAR PROP **

Magneto Switches ..... On
Starter ..... Engage (Maximum 15 Seconds)
Throttle ..... Adjust
Mixture ..... Advance Slowly to Full Rich
Oil Pressure ..... Check

STARTING ENGINES WHEN FLOODED

Throttle ..... Full Forward - Open
Propeller Control ..... Full Forward - Increase rpm
Master Switch ..... Check On
Mixture ..... Idle Cut-Off
Electric Fuel Pump ..... Off

** CLEAR PROP **

Magneto Switches ..... On
Starter ..... Engage (Maximum 15 Seconds)
Throttle ..... Retard
Mixture ..... Advance to Full Rich
Oil Pressure ..... Check

**** CAUTION ****

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.

STARTING WITH EXTERNAL POWER SOURCE

(For an aircraft that is equipped with an auxiliary power receptacle.)

Master Switch ..... Check Off
All Electrical Equipment ..... Check Off
Alternate Battery Terminals ..... Connect
External Power Cable ..... Insert in Fuselage

Initiate appropriate starting procedure.

Throttle(s) ..... Lowest Possible rpm
External Power Cable ..... Disconnect From Fuselage
Throttle ..... Above 1200 rpm
Master Switch ..... On
Ammeter ..... Check for Normal Charging

** **NOTE** ** Do not attempt flight if battery is not charging properly.

BEFORE TAXIING

Rotating Beacon ..... On
Electric Fuel Pump ..... Off
Wing Flaps ..... Retract
Wing Flap Selector ..... Center "OFF" Position
Landing Gear Indicator Light ..... Check Green
Avionics Master (Or Radios) ..... On
Radio Transfer Switches ..... As Required

Flight Instruments:

Artificial Horizon ..... Check Erect and Set
Rate-of-Climb Indicator ..... Check Zero
Altimeter ..... Adjust to Local Barometric Setting and Verify
Field Elevation Reading is Within Acceptable Limits
Clock ..... Wind and Set

** **NOTE** ** If flight plan anticipates instrument meteorological conditions:

Pitot Heat ..... On (Check Ammeter Discharge) Then Off

TAXIING

Taxi Area ..... Clear
Throttle ..... Apply Slowly
Brakes ..... Check
Steering ..... Check

ENGINE RUN UP

Brakes ..... Set
Warm Up ..... 2 to 4 Minutes at 800 to 1200 rpm
Mixture Controls ..... Check Rich

**** NOTE ****

Above 5,000 ft density altitude, mixture should be leaned for takeoff until, and only until, any engine roughness is eliminated.

Propeller Controls ..... Check Full Forward - Increase rpm
Throttle ..... 2000 rpm

**** CAUTION **** Do not exceed 2200 rpm in a routine static test.

Propeller ..... Cycle as Needed to Circulate Oil and Operate Governor

Normal Drop - 300 to 400 rpm

Throttle ..... 1000 to 1500 rpm
Propeller ..... Feather

**** CAUTION ****

Move propeller in and out of feathered position rapidly. Do not exceed a 500 rpm drop.

Manifold Pressure ..... 15 in Hg
Magnetos ..... Check Left and Right

Maximum Drop - 175 rpm
Maximum Difference - 50 rpm

Vacuum ..... 5.0 in Hg + .1 or - .2 in
Vacuum L and R Indicators ..... Check
Ammeter ..... Check Charging
X Alternator Push-to-Test (If Installed) ..... Check
Oil Temperature ..... Check
Oil Pressure ..... Check Green
Throttle ..... Retard

Repeat Procedure for Opposite Engine.

BEFORE TAKEOFF

Fuel Selectors ..... Leave on Inboard Main Tanks
Electric Fuel Pumps ..... On
Wing Flaps ..... Set for Takeoff (Zero to 15 Degrees as Desired)
Trim Tab ..... Set for Takeoff (Neutral Position for Most Operations)
Directional Gyro ..... Set Heading
Engine Gauges ..... Normal
Strobe Lights (If Installed) ..... On

**** NOTE ****

Engines are warm enough for takeoff when throttles can be opened without the engines faltering.

TAKEOFF

Throttles ..... Open Using a Smooth, Steady Movement
Accelerate to V_R ..... 90 mph (78 kt)
Control Wheel ..... Back Pressure to Rotate to Climb Attitude

** Establish Positive Rate of Climb **

Brakes ..... Tap
Landing Gear ..... Retract
Landing Gear Indicator ..... Amber
Climb Out at V_Y ..... 112 mph (97 kt)

1.) Maximum Performance Climb:

Power ..... Full Throttle and Maximum rpm

2.) Reduced Power Climb:

Full Power ..... Until 1000 ft AGL
Reduce Power to Climb Setting 25-25
Continue Climb at Best En Route Speed ..... 130 mph (113 kt)
Cylinder Head Temperature ..... Maintain in Green

SHORT FIELD TAKEOFF AND OBSTACLE CLEARANCE

Wing Flaps ..... 15 Degrees
Trim Tab ..... Set for Takeoff
Brakes ..... Partial Power Before Brake Release

Release brakes and continue opening throttle using a smooth, steady movement.

Accelerate to 70 to 80 mph (61 to 70 kt) depending on airplane weight.

Control Wheel ..... Back Pressure to Rotate to Climb Attitude

After breaking ground:

Accelerate to V_X ..... 90 mph (78 kt)

Climb past obstacle.

Accelerate to V_Y ..... 112 mph (97 kt)
Landing Gear ..... Retract
Wing Flaps ..... Retract
Power ..... As Required Above 1000 ft AGL
Continue Climb at Best En Route Speed ..... 130 mph (113 kt)

SOFT FIELD TAKEOFF

Wing Flaps ..... 15 Degrees
Trim Tab ..... Set for Takeoff
Control Wheel ..... Full Back Pressure to Relieve Airplane Weight
Throttle ..... Apply Slowly

**** NOTE ****

Once breakaway is achieved and taxi has begun, maintain airplane momentum to avoid becoming bogged down in soggy terrain.

Accelerate until airplane breaks ground. After breaking ground:

Stay in Ground Effect and Accelerate to V_X ..... 90 mph (78 kt)
Landing Gear ..... Retract

** Establish Positive Rate of Climb **

Accelerate to V_Y ..... 112 mph (97 kt)
Wing Flaps ..... Retract
Power ..... As Required Above 1000 ft AGL
Continue Climb at Best En Route Speed ..... 130 mph (113 kt)

**** NOTE ****

The figures for V_X and V_Y are based on a 3600 pound gross weight. Both V_X and V_Y decrease approximately one mph for every 100 pounds that the airplane is below maximum allowable gross weight.

V_X increases approximately 0.25 mph for each 1,000 foot increase in density altitude above mean sea level.

V_Y decreases approximately 0.75 mph for each 1,000 foot increase in density altitude above mean sea level.

CLIMB

Best Angle-of-Climb Speed (V_X) ..... 90 mph (78 kt)
Best Rate-of-Climb Speed (V_Y) ..... 112 mph (97 kt)
Best En Route Rate-of-Climb Speed ..... 130 mph (113 kt)
Cylinder Head Temperature ..... Maintain in Green
Mixture Controls ..... Adjust With Ascent
Electric Fuel Pumps ..... Off at Desired Altitude - Check Fuel Flow
Cowl Flaps ..... Closed at Desired Altitude

**** NOTE ****

Best en route rate-of-climb speed decreases approximately 0.75 mph for each 1,000 foot increase in density altitude above mean sea level.

When en route below 5,000 feet MSL, always return mixtures to full rich before increasing power settings. Above 5,000 feet MSL, adjust mixtures as required as over enriching the mixtures at high altitude will result in engine roughness.

CRUISING

** **NOTE** ** Operation above Flight Level 200 is not approved.

Power ..... Set Per Power Table in Section 5 (Performance)
Normal Maximum Cruise Power ..... 75 Percent
Mixture Controls ..... Adjust to EGT Gauge

Adjust to 100 degrees Fahrenheit rich of peak EGT at 75 % power.
Adjust to 50 degrees Fahrenheit rich of peak EGT at 65 % power.

**** WARNING ****

Test and verify that fuel is flowing properly from all tanks.

Auxiliary/Tip fuel may be used only in level cruise flight. If aircraft is equipped with wing tip tanks, use tip tank fuel first.

Oxygen is recommended when operating aircraft above 10,000 feet MSL, and required above 12,500 feet MSL. No smoking with oxygen in use.

Propellers ..... Synchronize
Engine Gauges ..... Monitor

DESCENT

Propeller Controls ..... Cruise rpm
Manifold Pressure Gauges ..... 15 to 17 in Hg
Airspeed ..... Maintain Cylinder Head Temperature in Green
Mixture Controls ..... Enrich With Descent

APPROACH AND LANDING

Seats ..... Erect
Belts and Harness ..... Fasten and Adjust
Electric Fuel Pumps ..... On
Fuel Selectors ..... Inboard Main Tanks
Landing Gear Selector ..... Down Under 125 mph or 108 kt (Recommended)
Landing Gear Indicator ..... Green
Wing Flaps ..... As Required Under 100 mph or 87 kt (Recommended)
Cowl Flaps ..... Open
Trim Tab ..... Set for Landing
Propeller Controls ..... 2400 rpm
Mixture Controls ..... Enrich as Required
GUMP Check ..... On Final
V_{APP} ..... 95 mph (83 kt)

**** NOTE ****

If crosswind component is above 12 kts, use partial or no wing flaps and above normal approach speed.

SHORT FIELD LANDING

Airspeed on Final ..... Coordinate to 90 mph (78 kt)
Throttles ..... Carry Power Until Flare
Wing Flaps ..... Retract Immediately After Touchdown
Control Wheel ..... Full Back Pressure to Put Airplane Weight on Main Landing Gear
Brakes ..... Apply Heavily

SOFT FIELD LANDING

Airspeed on Final ..... Coordinate to 90 mph (78 kt)
Throttles ..... Carry Power Until Flare
Wing Flaps ..... Leave Extended to Maximize Wing Lift
Control Wheel ..... Back Pressure to Relieve Airplane Weight
Brakes ..... Utilize Field Conditions to Slow Airplane, Minimum Braking Application

**** NOTE ****

The Comanche has been demonstrated safe when operating in and out of rough grass surfaces.

GO AROUND

Propeller Controls ..... Full Forward - Increase rpm
Throttles ..... Full Forward - Open
Control Wheel ..... Rotate to Climb Attitude

** Establish Positive Rate of Climb - Move to Right of Runway **

Landing Gear ..... Retract
Landing Gear Indicator ..... Amber
Climb Out at V_Y ..... 112 mph (97 kt)
Wing Flaps ..... Retract
Power ..... As Required Above 1000 ft AGL
Continue Climb at Best En Route Speed ..... 130 mph (113 kt)

AFTER LANDING

(Clear of Runway)

Wing Flaps ..... Retract
Wing Flap Selector ..... Center "OFF" Position
Strobe Lights (If Installed) ..... Off

ENGINE SHUTDOWN

Idle ..... Until a Decided Decrease in CHT is Noted
Electric Fuel Pumps ..... Off
Cabin Heater (If Used) ..... Off
Tune Comm Radio to 121.5 ..... Check ELT for False Operation
Rotating Beacon ..... Off
Avionics Master (Or Radios) ..... Off
Throttles ..... 1800 rpm
Clear Plugs ..... 15 to 20 Seconds
Throttles ..... Reduce to 1200 rpm
Mixture Controls ..... Idle Cut-Off

**** NOTE ****

When operating in high ambient temperatures, engine shutdown by mixture alone may not be positive. Under these conditions, to shut down engines, depress throttle cut-off release button on the left side of the power quadrant and retard throttles fully aft.

Magnetos ..... Off
Master Switch ..... Off

PARKING AND MOORING

Control Wheel ..... Secure Restraint
Wheel Chocks ..... In Place
Tie Downs ..... Secure
Pitot Head ..... Cover
Cabin Fresh Air Inlets ..... Closed
Storm Window ..... Secure
Doors ..... Locked