

### 3.0 Normal Procedures

#### 3.1 Pre-Flight Check (See Page 14)

- 1)
  - a. Release controls.
  - b. Check ignition switches "OFF".
  - c. Check fuel quantity on fuel gauges.
  - d. Fuel valve "ON".
  - e. Inspect seat belts for condition.
  - f. Secure rear seat belt, rear shoulder harness, and all loose or hanging objects if not in use. Determine that the rear seat folding back has two restrainer cables to prevent seat back from folding forward and interfering with rear stick movement.
  - g. Emergency locator transmitter - armed.
- 2)
  - a. Check right wing root cover for security.
  - b. Check aileron for freedom of movement and security.
  - c. Check wing and struts for general condition.
- 3)
  - a. Check right main wheel for condition and proper inflation.
  - b. Visually check right fuel quantity and filler cap security.
- 4)
  - a. Check oil level and secure dip stick. Inspect engine compartment for general condition, fuel leaks, oil leaks, etc.
  - b. Check that the cowl doors are properly latched.
  - c. On first flight of day and after refueling, drain fuel from gascolator.
  - d. Check windshield for cleanness.
  - e. Check prop for condition and prop spinner for security.
  - f. Check prop blade shank for excessive grease leakage.
  - g. Check air filter for cleanliness and security.
- 5)
  - a. Check left main wheel for condition and proper inflation.
  - b. Visually check left fuel quantity and filler cap security.
  - c. Check fuel vent for stoppage.
  - d. Check pitot tube for stoppage.
  - e. Inspect stall warning vane for freedom of movement.
- 6)
  - a. Check wing root cover for security.
  - b. Check aileron for freedom of movement and security.
  - c. Check wing and struts for general condition.

- 7) a. On first flight of day and after refueling, drain fuel from aft fuselage drain.  
b. Inspect bottom of aircraft for general condition.  
c. Inspect left static port for stoppage.
  
- 8) a. Check tail surfaces and brace wires for general condition.  
b. Check control surfaces and trim tab for freedom of movement and security.  
c. Check tail wheel security and proper inflation.  
d. Inspect right static port for stoppage.

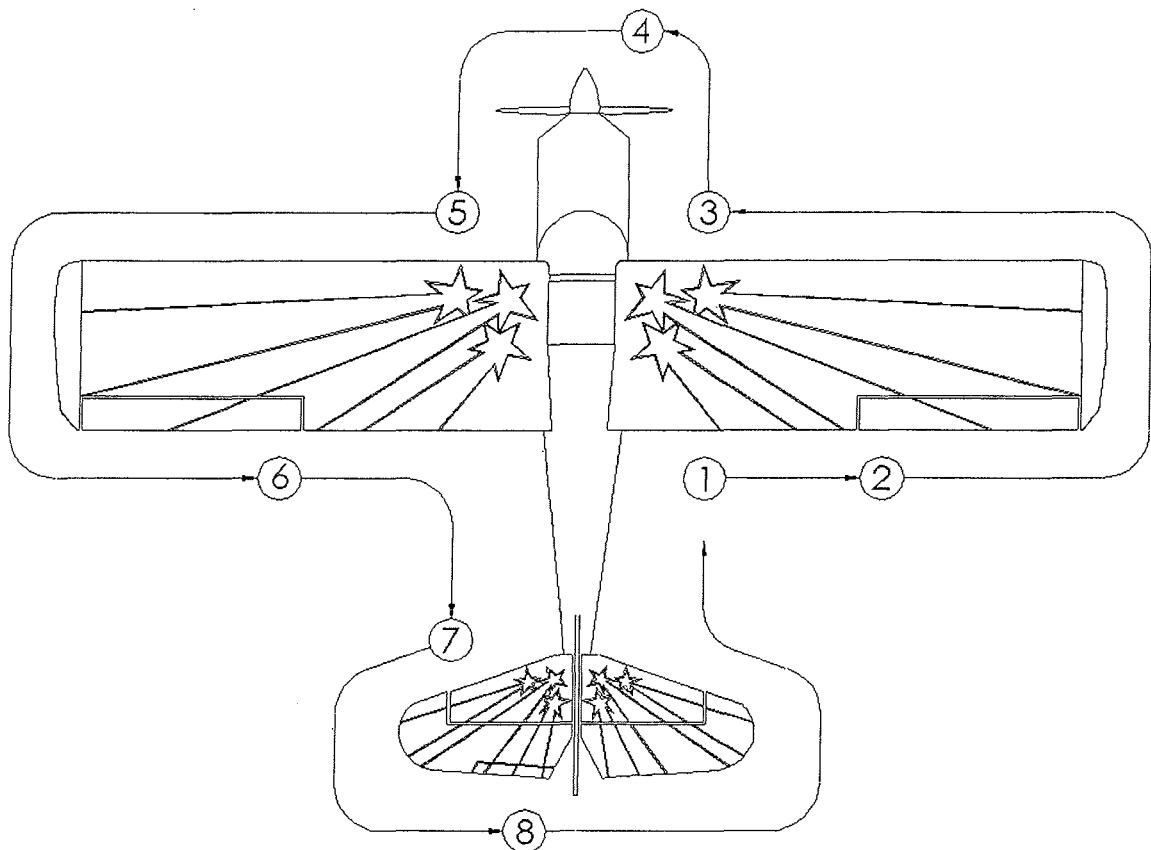


Figure 3-1, Pre-Flight Inspection (See Page 12)

### 3.2 Pre-Start Check

- 1) Seat belts - adjust and secure  
Lap belts must be taut; verify slack is not present in lap belts. Verify interference is not present between front lap belts and rear rudder pedals.
- 2) Fuel valve handle - on
- 3) Brakes - test and set
- 4) Radios and electrical equipment - off

### 3.3 Engine Start

The engine is equipped with one retard breaker magneto (left) and one standard magneto (right). Start on left magneto only.

#### CAUTION

Starting on both magnetos may result in kickback that may cause damage to the starter and or engine.

- 1) Master - on
- 2) Mixture - rich
- 3) Throttle - full
- 4) Fuel pump - on for 3 seconds
- 5) Mixture - idle cut off
- 6) Throttle - cracked
- 7) Alternate air - cold
- 8) Propeller area - clear
- 9) Ignition switch - left on
- 10) Starter button - depress, release when engine starts
- 11) Mixture - rich when engine starts
- 12) Ignition switch - right on
- 13) Oil pressure - check

#### Engine Hot Start:

- 1) Master - on
- 2) Mixture - idle cut off
- 3) Throttle - cracked
- 4) Alternate air - cold
- 5) Propeller area - clear
- 6) Ignition switch - left on
- 7) Starter button - depress, release when engine starts
- 8) Mixture - rich when engine starts
- 9) Ignition switch - right on
- 10) Oil pressure - check

#### Engine Flooded Start:

- 1) Master - on
- 2) Mixture - idle cut off
- 3) Throttle - full open
- 4) Alternate air - cold
- 5) Propeller area - clear
- 6) Ignition switch - left on
- 7) Starter button - depress, release when engine starts
- 8) Mixture - rich when engine starts
- 9) Throttle - reduce when engine starts
- 10) Ignition switch - right on
- 11) Oil pressure - check

### 3.4 Cockpit (Before Flight)

- 1) Cabin door - latched
- 2) Flight controls - check for freedom of movement and operation  
Verify lap belts are taut. Verify interference is not present between front lap belts and rear rudder pedals.
- 3) Trim tab - centered

### 3.5 Engine Run-Up

- 1) Throttle setting - 2100 rpm
- 2) Mixture - full rich or lean for altitude
- 3) Magnetos - check (150 rpm maximum drop, 50 rpm maximum differential)
- 4) Alternate air - check operation
- 5) Engine instruments - within green arc
- 6) Throttle - 1500 rpm
- 7) Propeller - cycle
- 8) Throttle - idle check

### 3.6 Takeoff (Normal)

- 1) Mixture - full rich or lean for altitude
- 2) Propeller - full forward
- 3) Fuel pump - on
- 4) Alternate air - cold
- 5) Throttle - full
- 6) Engine instruments - within green arc

### 3.7 Takeoff (Short Field)

- 1) Propeller - full forward
- 2) Fuel pump - on
- 3) Alternate air - cold
- 4) Brakes - apply
- 5) Throttle - full
- 6) Mixture - full rich or lean for altitude
- 7) Engine instruments - within green arc
- 8) Brakes - release
- 9) Rotate - 58 mph IAS
- 10) Obstacle speed - 70 mph IAS

### 3.8 Climb

- 1) Throttle - full
- 2) Mixture - full rich or lean for altitude
- 3) Propeller - full forward
- 4) Fuel pump - off
- 5) Climb speed - best rate
- 6) Engine instruments - within green arc

### 3.9 Cruise

- 1) Power - as desired
- 2) Elevator trim - adjust
- 3) Mixture - best power or best economy
- 3) Alternate air - as required
- 4) Engine instruments - within green arc

Best power can be determined by leaning the mixture until the first indication of power reduction. Enrich mixture three complete turns from the first indication of power reduction. Best power corresponds to 150°F rich of peak EGT. Use best power for cruise at or above 75% power.

Best economy can be determined by leaning the mixture until the first indication of power reduction. Enrich mixture power until smooth and engine power is restored, approximately one turn. Best economy corresponds to peak EGT. Use best economy for cruise below 75% power.

### 3.10 Landing (Normal)

- 1) Mixture - rich
- 2) Propeller - full forward
- 3) Fuel pump - on
- 4) Alternate air - hot
- 5) Airspeed - 80 mph IAS

### 3.11 Landing (Short Field)

- 1) Mixture - rich
- 2) Propeller - full forward
- 3) Fuel pump - on
- 4) Alternate air - hot
- 5) Airspeed - 76 mph IAS
- 6) Throttle - reduce to idle after obstacle
- 7) Brakes - apply

### 3.12 Balked Landing

- 1) Throttle - full
- 2) Alternate air - cold
- 3) Airspeed - 76 mph IAS

### 3.13 After Landing

- 1) Fuel pump - off
- 2) Alternate air - cold

### 3.14 Shut Down and Securing Aircraft

- 1) Parking - into the wind if possible
- 2) Park brake - set
- 3) Radios and electrical equipment - off
- 4) Magnetos - check
- 5) Mixture - idle cut-off
- 6) Ignition and master switches - off
- 7) Control lock - secure seat belt around front control stick

### 3.15 Alternate Air

Avoid using alternate air on the ground. With alternate air on, induction air is not filtered and abrasive dirt particles may enter the engine. In flight, use alternate air when icing is suspected. Turn "OFF" front and rear cabin heat to maximize alternate air temperature. Induction icing is indicated by a gradual loss of manifold pressure or engine roughness.

### 3.16 Fuel Pump

The fuel pump is used to provide fuel pressure for priming and to provide fuel pressure if the engine-driven pump fails. The fuel pump should be used during takeoff and landing and switched off during normal flight.

### 3.17 Detuning

Detuning the engine counterweight system can occur when the engine is operated outside of the normal range or by abrupt throttle movement.

#### CAUTION

Detuning results in rapid and severe damage to the counterweights, rollers, and bushings culminating in engine failure.

Avoid rapid throttle movement - give special consideration to high power settings; i.e. ground run up or in-flight power reduction.

Avoid high rpm and low manifold pressure - Avoid power-off descent below 15 in-Hg of manifold pressure. During approach do not select low pitch (high rpm) until it is assured that there will be no increase in engine rpm; i.e. idle power below 100 mph IAS.

### 3.18 Acrobatic Operation

Maneuvers limits are listed in Section 1.8. Determine that all loose objects, including unused seatbelts, are removed from the aircraft or secured to prevent movement in flight.

Full movement of the ailerons may be used at speeds up to  $V_A$  provided the load factor does not exceed +4.0 or -3.2 g. Use of ailerons above  $V_A$  should be smooth and limited to deflections that do not exceed the rate of roll at  $V_A$ .

#### CAUTION

Full abrupt use of the ailerons combined with full abrupt use of the elevator at  $V_A$  may produce loads in excess of design limits.

### 3.18 Acrobatic Operation (Continued)

A propeller setting of 2500 rpm is recommended for all maneuvers.

### 3.19 Spins

Acrobatic Category spins are approved. Loss of altitude including recovery from a six-turn spin may be as much as 3000 ft.

#### WARNING

Free release of the controls is not adequate for spin recovery; positive movement of the controls is required.

To enter a spin:

- 1) Throttle - reduce to idle
- 2) Airspeed - decelerate to stall
- 3) Rudder - apply in direction of spin
- 4) Elevator - apply fully to stall aircraft

To recover from a spin:

- 1) Throttle - idle
- 2) Neutralize ailerons
- 3) Apply full rudder opposite of rotation
- 4) Apply neutral elevator
- 5) When rotation stops neutralize rudder, apply elevator smoothly to raise nose

### 3.20 Maximum Demonstrated Crosswind

Maximum demonstrated crosswind velocity for takeoff and landing is 20 mph (17 knots).

### 3.21 Turbulence Penetration Speed

Do not exceed 110 mph IAS in rough air to prevent overstressing the aircraft. To minimize personal discomfort, decrease airspeed to 100 mph IAS. Maintain a constant pitch rather than flying by reference to the altimeter and airspeed indicators.

### 3.22 Noise Characteristics

The noise level measured in accordance with FAR 36, Appendix G and ICAO Annex 16, Vol. 1, Cap. 10 is 80.90 dBA.

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.