NORMAL PROCEDURES

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INTRODUCTION

Section 4 provides procedures and amplified instructions for normal operations using standard and optional equipment. Normal procedures associated with more complex optional equipment can be found in Section 9, Supplements.

AIRSPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 1320 pounds and may be used for any lesser weight.

TAKEOFF

Normal Climb . . . . . 65 - 75 KIAS
Short Field Takeoff, Flaps 10°, Speed at 50 Feet . . . . . 55 KIAS

ENROUTE CLIMB, FLAPS UP

Normal, Sea Level. . . . . 65 - 75 KIAS
Best Rate of Climb . . . . . 62 KIAS
Best Angle of Climb. . . . . 57 KIAS

LANDING APPROACH

Normal Approach, Flaps UP . . . . . 60 - 70 KIAS
Normal Approach, Flaps FULL . . . . . 55 - 60 KIAS
Short Field Approach, Flaps FULL . . . . . 50 KIAS

BALKED LANDING

Maximum Power, Flaps 25° . . . . . 50 KIAS

MAXIMUM RECOMMENDED TURBULENT AIR PENETRATION SPEED

1320 POUNDS . . . . . 89 KIAS
1200 POUNDS . . . . . 85 KIAS
1100 POUNDS . . . . . 80 KIAS

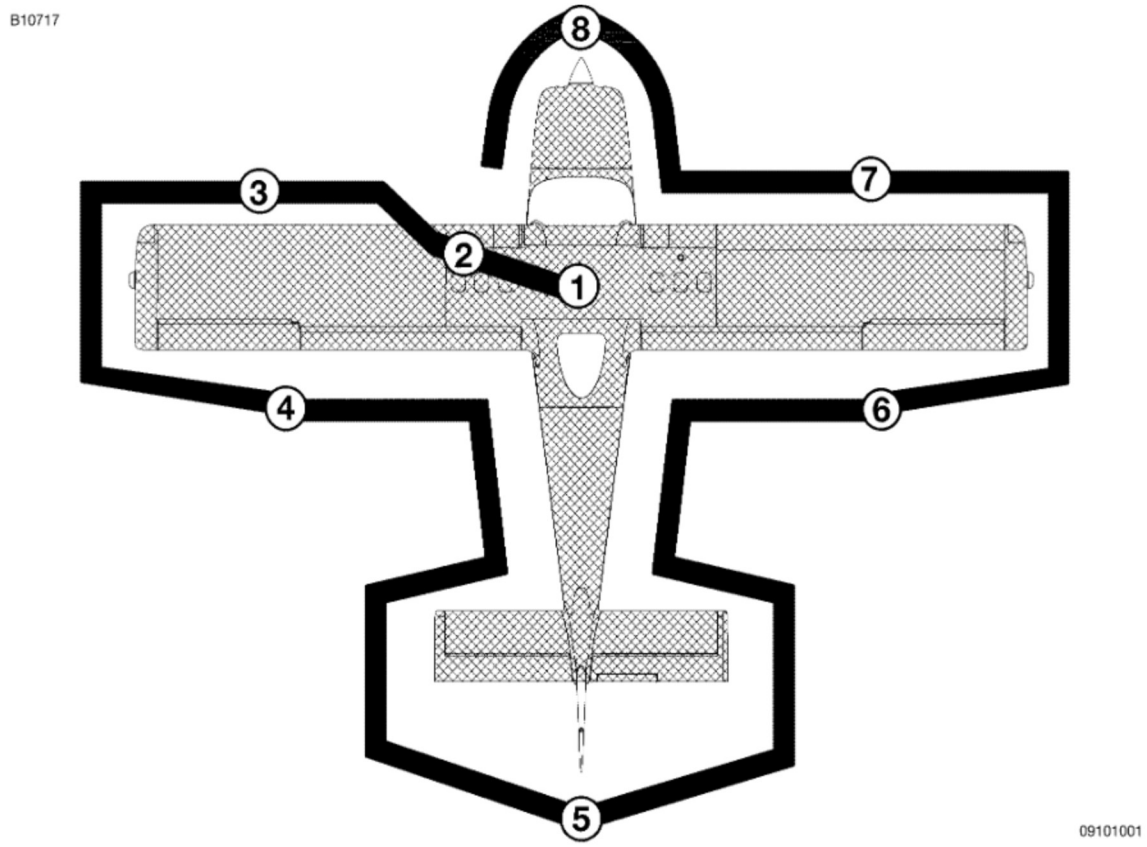
MAXIMUM DEMONSTRATED CROSSWIND VELOCITY

Takeoff or Landing. . . . . 12 KNOTS

MAXIMUM RECOMMENDED WIND VELOCITY

All Operations . . . . . 22 KNOTS

NORMAL PROCEDURES
PREFLIGHT INSPECTION



NOTE

Visually check airplane for general condition during walk-around inspection. Airplane should be parked in a normal ground attitude (refer to Figure 1-1) to make sure that fuel drain valves allow for accurate sampling. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.

Figure 4-1

PREFLIGHT INSPECTION (Continued)

① CABIN

1. Pilot's Operating Handbook - AS DESIRED
2. Garmin G300 Pilot's Guide - AS DESIRED
3. Pilot's Checklist - ACCESSIBLE TO PILOT
4. Parking Brake - SET
   a. Brakes - Apply
   b. PARKING BRAKE Control Knob - ON (pull full out)
5. Secondary Interior Door Latch (if installed) - OPEN
6. BRS Activation Handle (if installed) - CHECK
   a. Handle Mount - CHECK (security and condition)
   b. Safety Pin - INSTALLED AND FLAG ATTACHED
   c. Activation Cable - CHECK (security and condition)
7. Control Stick Lock - REMOVE
8. Wing Flaps - UP
9. Fuel Quantity Indicators - CHECK (L and R)

WARNING

- **TAKEOFF IS PROHIBITED WITH LESS THAN ¼ TANK OF FUEL.**

- **WHEN THE MASTER SWITCH IS ON, USING AN EXTERNAL POWER SOURCE, OR MANUALLY ROTATING THE PROPELLER, TREAT THE PROPELLER AS IF THE MAGNETOS SWITCH WERE ON. DO NOT STAND, NOR ALLOW ANYONE ELSE TO STAND, WITHIN THE ARC OF THE PROPELLER SINCE A LOOSE OR BROKEN WIRE, OR A COMPONENT MALFUNCTION, COULD CAUSE THE ENGINE TO START.**

10. MAGNETOS Switch - OFF
11. MASTER Switch (ALT and BAT) - ON
12. AVN MASTER Switch - ON
13. Primary Flight Display (PFD) - CHECK (verify PFD is ON and software current)

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PREFLIGHT INSPECTION (Continued)

① CABIN (Continued)

14. Multifunction Flight Display (MFD) (if installed) - CHECK (verify MFD is ON)
15. PFD ADAHRS Test and MFD SELF TEST - COMPLETE (verify no red X's shown)
16. LOW VOLTS Annunciator - CHECK (verify annunciator is shown)

NOTE

LOW VOLTS Annunciator will only be shown if battery voltage is less than 12.5 volts. Verify battery voltage on PFD/MFD ENG page.

17. Elevator Trim Control - T/O POSITION
18. Avionics Cooling Fan - CHECK (verify fan is operational)
19. Airplane Weight and Balance - CHECKED and ENTERED
20. AVN MASTER Switch - OFF
21. MASTER Switch (ALT and BAT) - OFF
22. Fire Extinguisher (if installed) - CHECK (verify gage pointer in green arc)
23. BRS Softpack (if installed) - CHECK (security and condition) Refer to Section 9, Supplement 5 for more information on the optional BRS installation.

② LEFT WING

1. Cabin Door - CHECK (security and condition)
2. Main Wheel Tire - CHECK (proper inflation and general condition (weather checks, tread depth and wear, etc.))
3. Brake Line - CHECK (security and condition)
4. Wheel Fairings (if installed) - CHECK (security and condition)
5. Fresh Air Vent - CHECK (blockage)

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

② **LEFT WING** (Continued)

6. Fuel Quantity - CHECK VISUALLY (for desired level)

WARNING

TAKEOFF IS PROHIBITED WITH LESS THAN ¼ TANK OF FUEL.

7. Fuel Filler Cap - SECURE and VENT CLEAR
8. Fuel Tank Sump Quick Drain Valves - DRAIN

   Drain at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard, or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

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PREFLIGHT INSPECTION (Continued)

③ LEFT WING Leading Edge

1. Fuel Tank Vent Opening - CHECK (blockage)
2. Wing Tiedown - DISCONNECT (check security and condition)
3. Pitot Tube Cover - REMOVE (check for pitot blockage)
4. Landing Light - CHECK (condition, operation and cleanliness of cover)
5. Strobe/Nav Light - CHECK (condition, operation and cleanliness of cover)

④ LEFT WING Trailing Edge

1. Aileron - CHECK (freedom of movement and security)

NOTE

Check for proper aileron movement by pushing the aileron up from the neutral (or faired with the flaps in the Flaps UP position) and returning the aileron back to the neutral or faired position. Pushing down on the aileron may create an over-centered condition requiring re-centering of the cockpit control stick.

2. Flap Gust Lock (if installed) - REMOVE
3. Flap - DEFLECT and CHECK (flap/aileron cables, up-spring tension and general condition)
4. Com Antenna and OAT Temp Probe - CHECK (security of attachment and general condition)
5. BRS Parachute Harness Covers (if installed) - CHECK (security of attachment and general condition)

⑤ EMPENNAGE

1. Rudder Gust Lock (if installed) - REMOVE
2. Control Surfaces - CHECK (freedom of movement and security)
3. Elevator Trim Tab - CHECK (security) (verify tab is faired with elevator and trim indicator in T/O position)
4. Tail Tiedown - DISCONNECT

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PREFLIGHT INSPECTION (Continued)

⑥ RIGHT WING Trailing Edge

1. ELT and GPS Antennas - CHECK (security of attachment and general condition)
2. Flap Gust Lock (if installed) - REMOVE
3. Flap - DEFLECT and CHECK (flap/aileron cables, up-spring tension and general condition)
4. Aileron - CHECK (freedom of movement and security)

NOTE

Check for proper aileron movement by pushing the aileron up from the neutral (or faired with the flaps in the Flaps UP position and returning the aileron back to the neutral or faired position. Pushing down on the aileron may create an over-centered condition requiring re-centering of the cockpit control stick.

⑦ RIGHT WING

1. Strobe/Nav Light - CHECK (condition, operation and cleanliness of cover)
2. Wing Tiedown - DISCONNECT (check security and condition)
3. Low Airspeed Alert and Stall Warning System Opening - CHECK (blockage)

NOTE

To check the system, place a clean handkerchief over the vent opening and apply suction; a sound from the warning horn will confirm system operation.

4. Fuel Quantity - CHECK VISUALLY (for desired level)

WARNING

TAKEOFF IS PROHIBITED WITH LESS THAN ¼ TANK OF FUEL.

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PREFLIGHT INSPECTION (Continued)

⑦ **RIGHT WING** (Continued)

5. Fuel Filler Cap - SECURE and VENT CLEAR
6. Main Wheel Tire - CHECK (proper inflation and general condition (weather checks, tread depth and wear, etc.))
7. Brake Line - CHECK (security and condition)
8. Wheel Fairings (if installed) - CHECK (security and condition)
9. Fuel Tank Sump Quick Drain Valves - DRAIN

   Drain at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

10. Cabin Door - CHECK (security, condition and make sure door is unlocked prior to flight)

WARNING

CABIN DOOR(S) CANNOT BE UNLOCKED FROM INSIDE THE AIRPLANE.

11. Fresh Air Vent - CHECK (blockage)

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PREFLIGHT INSPECTION (Continued)

⑧ NOSE

1. Engine Cooling Air Inlets - CHECK (clear of obstructions)
2. Propeller and Spinner - CHECK (for nicks and security)
3. Air Filter - CHECK (for condition and blockage by dust or other foreign matter)
4. Nosewheel Strut and Tire - CHECK (strut and general condition of tire (weather checks, tread depth and wear, etc.))
5. Nosewheel Fairing (if installed) - CHECK (security and condition)
6. Engine Exhaust Outlet - CHECK (security and condition)
7. Engine Oil Dipstick/Filler Cap:
   a. Oil level - CHECK
   b. Dipstick/filler cap - SECURE (lever horizontal and facing aft)

NOTE

Do not operate with less than 3.5 quarts. Fill to 5 quarts for extended flight.

8. Fuel Strainer Quick Drain Valve - DRAIN (bottom left side of engine cowling)

   Drain at least a cupful of fuel (using sampler cup) from valve to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points, including the fuel strainer and fuel sump valve, until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly the airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard, or damage to the environment.

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PREFLIGHT INSPECTION (Continued)

Ⓢ **NOSE** (Continued)

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

9. Fuselage Fuel Sump Quick Drain Valve - DRAIN (bottom center rear of engine cowling)

   Drain at least a cupful of fuel (using sampler cup) from valve to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points, including the fuel strainer and fuel sump valve, until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly the airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard, or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

10. Static Source Opening (left side of fuselage) - CHECK (verify opening is clear)

BEFORE STARTING ENGINE

1. Preflight Inspection - COMPLETE
2. Passenger Briefing - COMPLETE
3. Rudder Pedals - ADJUST
4. Seat Belts - ADJUST and SECURE
5. Cabin Doors - AS DESIRED
6. Brakes - TEST and SET
7. Circuit Breakers - CHECK IN
8. Electrical Equipment - OFF
9. AVN MASTER Switch - OFF

CAUTION

THE AVIONICS MASTER SWITCH MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE TO AVIONICS.

10. FUEL SHUTOFF Valve - ON (push full in)

STARTING ENGINE (With Battery)

1. AVN MASTER Switch - CHECK (verify off)
2. MASTER Switch (ALT and BAT) - ON
3. CARB HEAT Control Knob - OFF (push full in)
4. MIXTURE Control - FULL RICH (push full in)
5. Engine Indicating System - CHECK PARAMETERS (verify no red X's through indicators)
6. VOLTS - CHECK EIS ENGINE PAGE

NOTE

A red LOW VOLTS annunciator will come on when battery voltage is less than 12.5 volts. As battery voltage decreases, the Garmin G300 display will become less bright and eventually unreadable. If the starter fails to crank the engine or the G300 display becomes unreadable, service battery or apply external power.

7. AMPS - CHECK (verify discharge shown (negative))
8. STROBE Light Switch - ON

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STARTING ENGINE (With Battery) (Continued)

IF FUEL PRIMER CONTROL INSTALLED

IF ENGINE COLD

9. FUEL PRIMER Control - PUMP (1 to 3 strokes)
10. THROTTLE Control - OPEN 1/4 INCH

IF ENGINE WARM

9. FUEL PRIMER Control - NONE
10. THROTTLE Control - CLOSED

IF FUEL PRIMER CONTROL NOT INSTALLED

IF ENGINE COLD

9. THROTTLE Control - PUMP (3 to 6 strokes)
10. THROTTLE Control - OPEN 1/4 INCH

IF ENGINE WARM

9. THROTTLE Control - PUMP ONCE (push full in and pull full out)
10. THROTTLE Control - CLOSED

11. Propeller Area - CLEAR (verify that all people and equipment are at a safe distance from the propeller)
12. MAGNETOS Switch - START (release when engine starts)

NOTE

If the engine is primed too much (flooded), place the mixture control in the IDLE CUTOFF position, open the throttle control 1/2 to full, and engage the starter motor (START). When the engine starts, advance the mixture control to the FULL RICH position and promptly retard the throttle control.

13. Oil Pressure - CHECK (verify that oil pressure increases above 10 PSI into the YELLOW BAND range in 30 seconds)
14. THROTTLE Control - REDUCE TO IDLE
15. AMPS - CHECK (verify charge shown (positive))
16. NAV Light Switch - ON (as required)
17. STROBE Light Switch - OFF
18. AVN MASTER Switch - ON
19. MIXTURE Control - LEAN (as required)

STARTING ENGINE (With External Power) (if installed)

1. AVN MASTER Switch - CHECK (verify off)
2. MASTER Switch (ALT and BAT) - ON
3. VOLTS - CHECK EIS ENGINE PAGE

NOTE

A red LOW VOLTS annunciator will come on when battery voltage is less than 12.5 volts. As battery voltage decreases, the Garmin G300 display will become less bright and eventually unreadable. If the G300 display becomes unreadable, connect external power per the following procedure. The battery may require servicing.

4. AMPS - CHECK (verify discharge shown (negative))
5. MASTER Switch (ALT and BAT) - OFF
6. EXTERNAL POWER - CONNECT (to external power receptacle)
7. MASTER Switch (ALT and BAT) - ON
8. CARB HEAT Control Knob - OFF (push full in)
9. MIXTURE Control - FULL RICH (push full in)
10. Engine Indicating System - CHECK PARAMETERS (verify no red X's through indicators)
11. VOLTS - CHECK EIS ENGINE PAGE (verify 12.5 to 15.0 volts indication and LOW VOLTS annunciation is not shown)
12. AMPS - CHECK (verify charge shown (positive))
13. STROBE Lights Switch - ON

IF FUEL PRIMER CONTROL INSTALLED

IF ENGINE COLD

14. FUEL PRIMER Control - PUMP (1 to 3 strokes)
15. THROTTLE Control - OPEN 1/4 INCH

IF ENGINE WARM

14. FUEL PRIMER Control - NONE
15. THROTTLE Control - CLOSED

(Continued Next Page)

STARTING ENGINE (With External Power) (if installed) (Continued)

IF FUEL PRIMER CONTROL NOT INSTALLED

IF ENGINE COLD

14. THROTTLE Control - PUMP (3 to 6 strokes)
15. THROTTLE Control - OPEN 1/4 INCH

IF ENGINE WARM

14. THROTTLE Control - PUMP ONCE (push full in and pull full out)
15. THROTTLE Control - CLOSED

16. Propeller Area - CLEAR (verify that all people and equipment are at a safe distance from the propeller)
17. MAGNETOS Switch - START (release when engine starts)

NOTE

If the engine is primed too much (flooded), place the mixture control in the IDLE CUTOFF position, open the throttle control 1/2 to full, and engage the starter motor (START). When the engine starts, advance the mixture control to the FULL RICH position and promptly retard the throttle control.

18. Oil Pressure - CHECK (verify that oil pressure increases above 10 PSI into the YELLOW BAND range in 30 seconds)
19. THROTTLE Control - REDUCE TO IDLE
20. EXTERNAL POWER - DISCONNECT

CAUTION

HAVE GROUND ATTENDANT DISCONNECT GROUND POWER CABLE AND LATCH EXTERNAL POWER RECEPTACLE DOOR.

21. Power - INCREASE (to approximately 1500 RPM for several minutes to charge battery)
22. AMPS - CHECK (verify charge shown (positive))

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STARTING ENGINE (With External Power) (if installed) (Continued)

23. VOLTS - CHECK EIS ENGINE PAGE (verify 12.5 VOLTS minimum shown)
24. LOW VOLTS Annunciator - CHECK (verify annunciator is not shown)
25. Internal Power - CHECK
    a. MASTER Switch (ALT) - OFF
    b. LDG Light Switch - ON
    c. NAV Light Switch - ON
    d. THROTTLE Control - REDUCE TO IDLE
    e. MASTER Switch (ALT) - ON
    f. THROTTLE Control - INCREASE (to approximately 1500 RPM)
    g. AMPS - CHECK (verify charge shown (positive))

WARNING

IF AMMETER DOES NOT SHOW POSITIVE CHARGE (+ AMPS), REMOVE BATTERY FROM AIRPLANE AND SERVICE OR REPLACE BATTERY BEFORE NEXT FLIGHT.

26. LDG Light Switch - OFF (as required)
27. STROBE Light Switch - OFF
28. AVN MASTER Switch - ON
29. THROTTLE Control - REDUCE TO IDLE
30. MIXTURE Control - LEAN (as required)

TAXI CHECK

1. Brakes - CHECK (verify proper operation)
2. Flight Instruments - CHECK (verify proper indication while taxing)

BEFORE TAKEOFF

1. Parking Brake - SET
   a. Brakes - APPLY
   b. PARKING BRAKE Control Knob - ON (pull full out)
2. Rudder Pedals and Seat Belts - ADJUST and SECURE
3. Cabin Doors - CHECK
   a. Primary Interior Door Latches - LATCHED
   b. Secondary Interior Door Latches (if installed) - LATCHED
4. Flight Controls - FREE and CORRECT
5. Flight Instruments (PFD) - CHECK (verify no red X's through indicators)
6. Engine Indicating System - CHECK PARAMETERS (verify no red X's through indicators)
7. Altimeter - SET
8. Fuel Quantity Indicators - CHECK (verify level is correct)

WARNING

TAKEOFF IS PROHIBITED WITH LESS THAN ¼ TANK OF FUEL.

9. FUEL PRIMER Control Knob (if installed) - IN and LOCKED
10. MIXTURE Control - RICH
11. Autopilot (if installed) - CHECK (refer to Section 9, Supplement 8 for operating procedures and system information)
12. Elevator Trim Control Switch - SET FOR T/O
13. THROTTLE Control - 1700 RPM (once oil temperature is above 75°F and oil pressure in green band range)
    a. MAGNETOS Switch - CHECK (RPM drop should not exceed 150 RPM on either magneto or 50 RPM differential between magnetos)
    b. Engine Indicators - CHECK
    c. CARB HEAT Control Knob - ON (pull full out)
       (1) Engine RPM - CHECK (verify RPM decreases)
       (2) CARB °F - CHECK (verify temp increases)
    d. CARB HEAT Control Knob - OFF (push full in)
    e. AMPS and VOLTS - CHECK

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BEFORE TAKEOFF (Continued)

14. Annunciators - CHECK (verify no annunciators are shown)
15. THROTTLE Control - CHECK IDLE (800 RPM or LESS)
16. THROTTLE Control Friction Lock - ADJUST
17. COM Frequency - SET
18. GPS Flight Plan - AS DESIRED
19. Transponder - SET
20. Wing Flaps - UP - 10° (10° recommended)
21. NAV Light Switch - ON
22. STROBE Light Switch - ON
23. BRS Activation Handle Safety Pin (if installed) - REMOVE and STOW (stow in door panel with zipper closed or pedestal side pocket for security and easy access after landing)
24. PARKING BRAKE Control Knob - OFF (push full in)

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps - UP - 10° (10° recommended)
2. CARB HEAT Control Knob - OFF (push full in)
3. THROTTLE Control - FULL (push full in)
4. MIXTURE Control - RICH (above 3000 feet pressure altitude, lean for maximum RPM)
5. Directional Control - MAINTAIN (use differential braking until rudder control becomes effective)
6. Elevator Control - LIFT NOSEWHEEL AT 50 KIAS
7. Climb Airspeed - 65 - 75 KIAS
8. Wing Flaps - RETRACT (at safe altitude)

SHORT FIELD TAKEOFF

1. Wing Flaps - 10°
2. CARB HEAT Control Knob - OFF (push full in)
3. Brakes - APPLY
4. THROTTLE Control - FULL (push full in)
5. MIXTURE Control - RICH (above 3000 feet pressure altitude, lean for maximum RPM)
6. Brakes - RELEASE
7. Elevator Control - SLIGHTLY TAIL LOW
8. Directional Control - MAINTAIN (use differential braking until rudder control becomes effective)
9. Climb Airspeed - 55 KIAS (until all obstacles are cleared)
10. Wing Flaps - RETRACT SLOWLY (when airspeed is more than 60 KIAS)

ENROUTE CLIMB

1. Airspeed - 65 - 75 KIAS
2. THROTTLE Control - FULL (push full in)
3. MIXTURE Control - RICH (above 3000 feet pressure altitude, lean for maximum RPM)

NOTE

For maximum performance climb speeds, refer to Section 5, Figure 5-6, Maximum Rate of Climb at 1320 Pounds.

CRUISE

1. Power - 2400 - 2750 RPM (75% recommended)
2. Elevator Trim Control Switch - ADJUST
3. MIXTURE Control - LEAN (for best power setting)

DESCENT

1. Power - AS DESIRED (2750 RPM maximum)
2. MIXTURE Control - ADJUST (if necessary to make engine run smoothly)
3. Altimeter - SET
4. Wing Flaps - AS DESIRED (UP - 10° below 100 KIAS)
   (10° - 25° below 85 KIAS)
   (25° - FULL below 70 KIAS)
5. CARB HEAT Control Knob - ON (as required)

BEFORE LANDING

1. Rudder Pedals and Seat Belts - ADJUST and SECURE
2. MIXTURE Control - RICH (push full in) (below 3000 feet pressure altitude)
3. CARB HEAT Control Knob - ON (pull full out) (apply full heat before reducing power)
4. LDG Light Switch - ON
5. Autopilot (if installed) - OFF

LANDING

NORMAL LANDING

1. Airspeed - 60 - 70 KIAS (Flaps UP)
2. Wing Flaps - AS DESIRED (UP - 10° below 100 KIAS)
   (10° - 25° below 85 KIAS)
   (25° - FULL below 70 KIAS)
3. Airspeed - 55 - 60 KIAS (Flaps FULL)

NOTE

The Low Airspeed Alert and Stall Warning System horn may sound as the airplanes slows for landing flair and touchdown. Pilot should monitor airspeed closely and be prepared to initiate stall avoidance procedures.

4. Elevator Trim Control Switch - ADJUST
5. Touchdown - MAIN WHEELS FIRST
6. Landing Roll - LOWER NOSEWHEEL GENTLY
7. Braking - MINIMUM REQUIRED
8. Directional Control - MAINTAIN (with rudder and differential braking)

SHORT FIELD LANDING

1. Airspeed - 60 - 70 KIAS (Flaps UP)
2. Wing Flaps - FULL
3. Airspeed - 50 KIAS (until flare)

NOTE

The Low Airspeed Alert and Stall Warning System horn will sound during short field landing approach to alert pilot of the low airspeed condition. Pilot should monitor airspeed closely and be prepared to initiate stall avoidance procedures.

4. Elevator Trim Control - ADJUST
5. Power - REDUCE TO IDLE (as obstacle is cleared)
6. Touchdown - MAIN WHEELS FIRST
7. Brakes - APPLY HEAVILY (while maintaining directional control)
8. Wing Flaps - UP

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LANDING (Continued)

BALKED LANDING

1. THROTTLE Control - FULL (push full in)
2. CARB HEAT Control Knob - OFF (push full in)
3. Wing Flaps - RETRACT to 25°
4. Climb Speed - 50 KIAS (until obstacle is cleared)
5. Climb Speed - 60 KIAS (after obstacle is cleared)
6. Wing Flaps - 10°, then UP (after reaching a safe altitude and 60 KIAS)

AFTER LANDING

1. CARB HEAT Control Knob - OFF (push full in)
2. Wing Flaps - UP
3. STROBE Light Switch - OFF
4. Transponder - STBY
5. BRS Activation Handle Safety Pin (if installed) - INSTALL
6. Cabin Doors - AS DESIRED

SECURING AIRPLANE

1. Parking Brake - SET
   a. Brakes - APPLY
   b. PARKING BRAKE Control Knob - ON (pull full out)
2. THROTTLE Control - IDLE (pull full out)
3. Electrical Equipment - OFF
4. AVN MASTER Switch - OFF
5. MIXTURE Control - IDLE CUTOFF (pull full out)
6. MAGNETOS Switch - OFF
7. MASTER Switch (ALT and BAT) - OFF
8. Control Lock - INSTALL
9. BRS Activation Handle (if installed) - CHECK (verify safety pin installed and flag visible)
10. Cabin Doors - CHECK
    a. Secondary Interior Door Latches (if installed) - OPEN
    b. Right Primary Interior Door Latch - LATCHED
    c. Left Cabin Door - CLOSED and LATCHED
    d. Cabin Door Lock(s) - AS DESIRED
11. External Gust Locks - INSTALL (as desired)

AMPLIFIED NORMAL PROCEDURES

PREFLIGHT INSPECTION

The preflight inspection, described in Figure 4-1 and adjacent checklist, is required prior to each flight. If the airplane has been in extended storage, has had recent major maintenance, or has been operated from rough runways, a more extensive exterior inspection is recommended.

Before every flight, check the condition of main and nose landing gear tires. Keep tires inflated to the pressure specified in Section 8, Airplane Handling, Service And Maintenance. Examine tire sidewalls for patterns of shallow cracks called weather checks. These cracks are evidence of tire deterioration caused by age, improper storage, or prolonged exposure to weather. Check the tread of the tire for depth, wear, and cuts. Replace the tire if fibers are visible.

After major maintenance has been performed, the flight and trim tab controls should be double checked for free and correct movement and security. The security of all inspection plates on the airplane should be checked following periodic inspections. If the airplane has been waxed or polished, check the external static pressure source hole for stoppage.

If the airplane has been kept in a crowded hangar, it should be checked for dents and scratches on wings, fuselage, and tail surfaces, damage to navigation/strobe light assemblies, wing tip fairings and avionics antennas. Check for damage to the nosewheel travel stops and wheel fairings (if installed), resulting from exceeding nosewheel turning limits while towing.

Outside storage for long periods may result in dust and dirt accumulation on the induction air filter, obstructions in airspeed system lines, water contaminants in fuel tanks, and insect/bird/rodent nests in any opening. If any water is detected in the fuel system, the fuel tank sump quick drain valves, fuel sump quick drain valve, and fuselage sump quick drain valve should all be thoroughly drained again. The wings should then be gently rocked and the tail lowered to the ground to move any further contaminants to the sampling points. Repeated samples should then be taken at **all** quick drain points until **all** contamination has been removed.

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard, or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

When parked on the ramp, care should be exercised to make sure wings are level or the left wing slightly higher to prevent fuel from dripping from the fuel vent when fuel tanks are full. To prevent loss of fuel in flight, make sure the fuel tank filler caps are tightly sealed after any fuel system check or servicing. Fuel system vents should also be inspected for obstructions, ice or water, especially after exposure to cold, wet weather.

If the airplane has been stored outside in windy or gusty areas, or tied down adjacent to taxiing airplanes, special attention should be paid to control surface stops, hinges, and brackets to detect the presence of potential wind damage. Use of external gust locks on flaps and control surfaces is recommended for outside storage.

Airplanes that are operated from rough fields, especially at high altitudes, are subjected to abnormal landing gear abuse. Frequently check all components of the landing gear, strut, tires, and brakes. If the airplane has been operated from muddy fields or in snow or slush, check the main and nose gear wheel fairings for obstructions and cleanliness.

Operation from a gravel or cinder field will require extra attention to propeller tips and abrasion on leading edges of the horizontal tail. Stone damage to the propeller can seriously reduce the fatigue life of the blades.

BEFORE STARTING ENGINE

Rudder pedals should be adjusted fore and aft as needed to ensure the pilot has full brake deflection with the rudder fully deflected. A small percentage of pilots may require additional cushions to correctly position themselves for visibility and control.

Ideally, the pilot should be positioned so that the outboard elbow naturally rests on the door armrest and the control stick falls within the hand of that arm. Correct positioning allows for relaxed flying using wrist movements and assists the new pilot to adjusting to the Skycatcher flight controls.

STARTING ENGINE

Engine starting can differ depending on the temperature of the engine and surrounding ambient air which affects the amount of fuel priming required. Standard priming is done using the throttle control. Pumping the throttle, by rapidly advancing the throttle control fully in and out, works an accelerator pump in the engine carburetor for priming. In this way, the throttle may be pumped or given some number of "strokes" to provide the required prime. An optional plunger style primer may be used to provide fuel prime (if installed).

If the engine is already warm, pump the throttle once then leave the throttle closed to start. No additional priming should be required. A cold engine with moderately warm (room temperature) ambient air will require 1 or 2 strokes of the throttle (or primer). A cold engine with cold ambient air (temperatures above freezing) will require up to 3 or 4 strokes of throttle (or primer). A cold engine should have the throttle open approximately ¼ inch for start.

In extremely cold temperatures, it may be necessary to continue priming while cranking the engine. If the engine is under primed, most likely in cold weather with a cold engine, it will not fire at all, and additional priming will be necessary. As soon as the cylinders begin to fire, open the throttle slightly to keep it running.

(Continued Next Page)

STARTING ENGINE (Continued)

Weak intermittent firing followed by puffs of black smoke from the exhaust stack indicates over priming or flooding. Excess fuel can be cleared from the combustion chambers by the following procedure: set parking brake and hold brakes, set the mixture control full lean (idle cutoff) and the place throttle control to full open; then crank the engine through several revolutions with the starter. Be prepared to immediately reduce throttle control to idle once engine starts. Repeat the starting procedure without any additional priming.

After starting, if the oil pressure gage does not begin to show pressure within 30 seconds in the summertime and about twice that long in very cold weather, stop the engine and investigate. Lack of oil pressure can cause serious engine damage. After starting, avoid the use of carburetor heat unless icing conditions prevail.

NOTE

Additional details concerning cold weather starting and operation may be found under COLD WEATHER OPERATION paragraphs in this section.

After the completion of normal engine starting procedures, it is a good practice to verify that the engine starter has disengaged. If the starter contactor were to stick closed, causing the starter to remain engaged, an excessively high charge indication (full scale at 1000 RPM) would be evident on the ammeter. In this event, immediately shut down engine and have electrical system inspected by qualified maintenance personnel prior to next flight.

RECOMMENDED STARTER DUTY CYCLE

Operate the starter motor for 10 seconds followed by a 20 second cool down period. This cycle can be repeated five additional times, followed by a thirty minute cool down period before resuming cranking. After cool down, operate the starter motor again, six cycles of 10 seconds followed by 20 seconds of cool down. If the engine still does not start, try to find the cause.

LEANING FOR GROUND OPERATIONS

For all ground operations, after starting the engine and when the engine is running smoothly:

1. THROTTLE Control - 1200 RPM
2. Mixture Control - ADJUST (lean for maximum RPM)
3. THROTTLE Control - ADJUST for ground operation (800 to 1000 RPM recommended)

NOTE

If ground operation will be required after the BEFORE TAKEOFF checklist is completed, lean the mixture again (as described above) until ready for the TAKEOFF checklist.

TAXIING

CAUTION

DUE TO LOWER WEIGHTS AND SLOWER STALL SPEEDS THAN LARGER AIRPLANES, PROPER TAXI TECHNIQUES SHOULD BE USED IN WINDY CONDITIONS. OPERATIONS IN WIND CONDITIONS ABOVE 22 KNOTS ARE NOT RECOMMENDED.

When taxiing, the combination of differential braking and free-castering nosewheel provide excellent ground maneuvering in tight spaces as well as control during normal taxiing. Differential brake application should be done by firm, short taps of the brake pedal so as to nudge the airplane in the desired direction. Excess speed and “riding a brake” should be avoided since this can cause brake heating, brake fade, or loss of braking effectiveness resulting in loss of control or stopping ability.

It is important that taxi speed be held to that of a brisk walk and all flight controls be utilized up to their maximum deflection (refer to Figure 4-2, Taxiing Diagram) to aid in maintaining directional control. This is particularly important in windy conditions.

(Continued Next Page)

TAXIING (Continued)

NOTE

Strong or gusty tail winds can over power the wing flap return springs causing the flaps to randomly blow down while taxiing. Selecting flaps to FULL when taxing with a tailwind can prevent the blow down. Use caution to prevent a build-up of taxi speed due to blowing by strong tailwinds. Flaps should be retracted when turning away from the tailwind condition and the BEFORE TAKEOFF Checklist should be used to insure flaps are properly reset before takeoff.

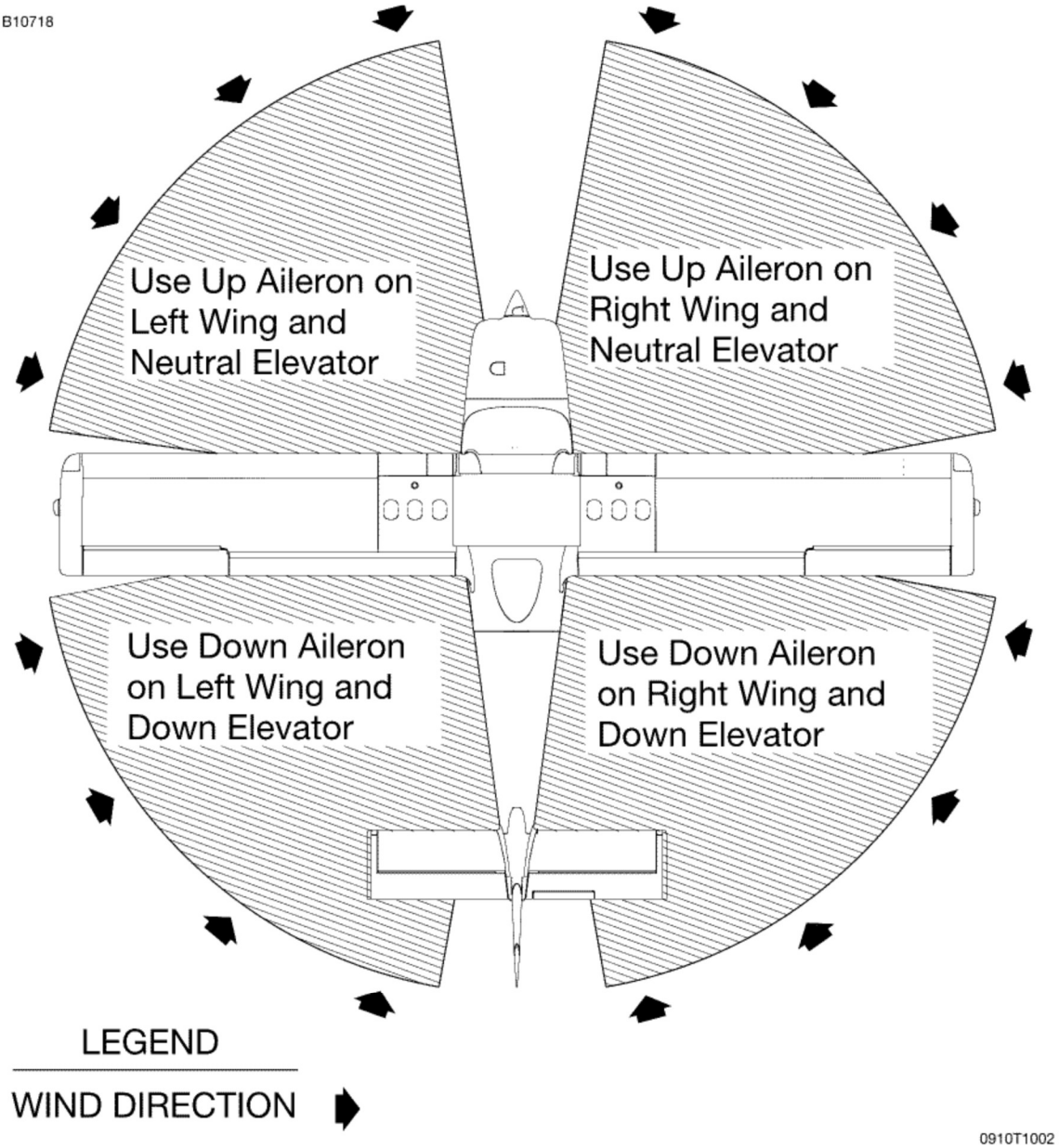
The CARB HEAT control knob should be pushed full in to the OFF position during all ground operations unless carb heat is absolutely necessary to correct engine roughness. When the CARB HEAT control knob is pulled out to the ON position, air entering the engine is not filtered. However, if needed, use FULL CARB HEAT until engine roughness clears. Monitoring the CARB ºF Indicator will assist in amount of carb heat required to keep the carburetor temperature out of the yellow caution range and prevent engine roughness.

Taxiing over loose gravel or cinders should be done at the lowest engine RPM possible to avoid abrasion and stone damage to the propeller tips.

(Continued Next Page)

TAXIING (Continued)

TAXIING DIAGRAM



NOTE

Strong quartering tail winds require caution. Avoid sudden bursts of the throttle and sharp braking when the airplane is in this attitude. Use differential braking and rudder to maintain direction.

Figure 4-2

BEFORE TAKEOFF

WARM UP

If the engine idles with the throttle against the idle stop, approximately 700 to 800 RPM and accelerates smoothly, the engine is warm enough for takeoff. Since the engine is closely cowled for efficient in-flight engine cooling, the airplane should be pointed into the wind to avoid overheating during prolonged engine operation on the ground. Refer to Leaning For Ground Operations procedures to prevent spark plug fouling that can occur from long periods of idling and prolonged ground operations.

MAGNETO CHECK

CAUTION

MAKE SURE ENGINE OIL TEMPERATURE IS ABOVE 75ºF AND OIL PRESSURE IS WITHIN THE GREEN BAND RANGE PRIOR TO PREFORMING A MAGNETO CHECK.

The magneto check must be made at 1700 RPM. Turn the MAGNETOS switch from the BOTH position to the R position. Note the new RPM, then turn the MAGNETOS switch back to the BOTH position to clear the spark plugs. Turn the MAGNETOS switch to the L position, note the new RPM, then turn the switch back to the BOTH position. RPM decrease should not be more than 150 RPM on either magneto or be greater than 50 RPM differential between magnetos. If there is a doubt concerning operation of the ignition system, RPM checks at higher engine speeds will usually confirm whether a deficiency exists.

No RPM drop may indicate a faulty ground to one magneto or magneto timing set in advance of the angle specified.

(Continued Next Page)

BEFORE TAKEOFF (Continued)

ALTERNATOR CHECK

The alternator should be checked for proper operation before every flight. Electrical power is essential for all flight instrumentation, navigation, and radio operation. Check the electrical system during the MAGNETO check (1700 RPM) by setting all electrical equipment required for the flight to the ON position. When the alternator is operating properly, the ammeters will show zero or positive current (+ amps), the voltmeter will show 13 to 15 volts, and the LOW VOLTS annunciator will not be shown on the PFD. Reduce the electrical load before reducing engine speed so the battery will not discharge while the engine is at idle.

ELECTRIC ELEVATOR TRIM

Make sure the elevator trim tab is in the takeoff position when the trim pointer is aligned with the T/O index mark on the EIS TRIM indicator. Adjust the trim during flight as necessary to make control wheel forces more neutral.

TAKEOFF

POWER CHECK

It is important to check full throttle engine operation early in the takeoff roll. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full throttle static run-up before another takeoff is attempted. A engine operating at normal temperature should run smoothly and turn approximately 2280 - 2380 RPM with carburetor heat off and the mixture leaned to provide maximum RPM.

NOTE

Carburetor heat should not be used during takeoff unless it is absolutely necessary to obtain smooth engine acceleration.

Full throttle run-ups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, advance the throttle slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown behind the propeller rather than pulled into it.

Prior to takeoff from fields above 3000 feet pressure altitude, the mixture should be leaned to give maximum RPM at full throttle, with the airplane not moving.

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from moving back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to hold the throttle setting.

(Continued Next Page)

TAKEOFF (Continued)

WING FLAP SETTINGS

Normal takeoffs use wing flaps UP - 10°. Using 10° wing flaps reduces the ground roll to lift off while keeping the total distance over an obstacle by equivalent to the flaps UP distances. **Flap deflections greater than 10° are not approved for takeoff.** If 10° wing flaps are used for takeoff, the flaps should stay at 10° until all obstacles are cleared and a safe flap retraction speed of 60 KIAS is reached. For a short field, 10° wing flaps and an obstacle clearance speed of 55 KIAS should be used.

Soft or rough field takeoffs are performed with 10° flaps by lifting the airplane off the ground as soon as practical in a slightly tail low attitude. If no obstacles are ahead, the airplane should be leveled off immediately to accelerate to a higher climb speed. When departing a soft field with an aft C.G. loading, the elevator trim control should be adjusted towards the nose down direction to give comfortable control wheel forces during the initial climb.

NOTE

The Low Airspeed Alert and Stall Warning System horn may sound during takeoff at slow rotation speeds to alert pilot of the low airspeed condition. Pilot should monitor airspeed closely and be prepared to initiate stall avoidance procedures.

CROSSWIND TAKEOFF

Takeoffs under strong crosswind conditions normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after takeoff. Begin the takeoff with ailerons fully deflected into the wind. As the airplane is accelerated, reduce aileron deflection maintaining directional control down the runway. Reaching a speed slightly higher than normal rotation speed, apply gentle back pressure to the elevator control and quickly, but carefully, lift the airplane off the ground. Do not over rotate but keep positive pitch angle and airspeed to prevent possible settling back to the runway. When well clear of the ground, make a coordinated turn into the wind to correct for drift.

ENROUTE CLIMB

Normal enroute climbs are performed with flaps up, at full throttle and 65 to 75 KIAS for the best combination of performance, visibility and engine cooling. The mixture should be full rich during climb at altitudes up to 3000 feet pressure altitude. Above 3000 feet pressure altitude, the mixture can be leaned as needed for increased power or to provide smoother engine operation.

If it is necessary to climb more rapidly to clear mountains or reach favorable winds at higher altitudes, the best rate of climb speed is 62 KIAS and should be used with Maximum Continuous Power (MCP).

If an obstruction dictates the use of a steep climb angle, the best angle of climb speed is 57 KIAS and should be used with flaps UP and MCP. This type of climb should be of the minimum duration and engine temperatures should be carefully monitored due to the low climb speed.

CRUISE

Normal cruise is performed between 40% and 75% power. The engine RPM and corresponding fuel consumption for various altitudes can be determined by using the data in Section 5.

NOTE

Cruise flight should use 75% power as much as possible until the engine has operated for a total of 50 hours or oil consumption has stabilized. Operation at this higher power will ensure proper seating of the piston rings and is applicable to new engines, and engines in service following cylinder replacement or top overhaul of one or more cylinders.

The Cruise Performance charts in Section 5 provide the pilot with flight planning information for the Model 162 in still air at maximum gross weight without speed fairings installed. Cruise performance may differ slightly due to differences in weight and center of gravity location.

(Continued Next Page)

CRUISE (Continued)

The Cruise Performance charts should be used as a guide, along with the available winds aloft information, to determine the most favorable altitude, power setting and fuel needed for a given flight.

The selection of cruise altitude on the basis of the most favorable wind conditions and the use of low power settings are significant factors that should be considered on every trip to reduce fuel consumption.

Proper leaning techniques also contribute to greater range and are figured into cruise performance tables. To achieve the recommended lean mixture fuel consumption figures shown in Section 5, the mixture should be leaned per recommended procedures.

In the event that unusual conditions cause the intake air filter to become clogged or iced over, apply carburetor heat immediately to bypass the intake air filter therefore providing unfiltered heated air as the alternate air intake. Engine RPM can decrease from a cruise power setting. This RPM loss should be recovered by increasing the throttle setting to maintain desired power.

Carburetor ice, as evidenced by an unexplained drop in RPM, can be removed by application of full carburetor heat. Upon regaining the original RPM (with heat off), use the minimum amount of heat (reference EIS CARB ºF display) to prevent ice from forming. Since the heated air causes a richer mixture, readjust the mixture setting when carburetor heat is to be used continuously in cruise flight.

The use of full carburetor heat is recommended during flight in heavy rain to avoid the possibility of engine stoppage due to excessive water ingestion or carburetor ice. The mixture setting should be readjusted for smoothest operation. Power changes should be made cautiously, followed by prompt adjustment of the mixture for smoothest operation.

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CRUISE (Continued)

LEANING WITHOUT EXHAUST GAS TEMPERATURE (EGT) INDICATOR

BEST POWER CRUISE

Use the mixture control vernier adjustment to lean the fuel mixture by slowly turning the mixture control knob in the counterclockwise direction while monitoring engine RPM. As RPM increases, continue to carefully lean the mixture until it reaches peak RPM. Slightly enrichen mixture (turn mixture control knob clockwise) until a slight drop in engine RPM is indicated. This is the Best Power Cruise setting.

CAUTION

EXCESSIVE LEANING WILL INCREASE ENGINE TEMPERATURES AND MAY DAMAGE ENGINE. WHEN INCREASING POWER, ENRICHEN MIXTURE, THEN ADVANCE THE THROTTLE TO INCREASE RPM. WHEN REDUCING POWER, RETARD THROTTLE, THEN ADJUST THE MIXTURE CONTROL.

Lean the mixture for maximum RPM during all operations at any altitude, including those below 3000 feet, when using 75% or less power. Above 3000 feet, mixture may be leaned for maximum RPM during full throttle climbs (after engine has accumulated 50 hours).

(Continued Next Page)

CRUISE (Continued)

LEANING WITH EXHAUST GAS TEMPERATURE (EGT) INDICATOR (if installed)

The cruise performance data in this POH is based on the recommended lean mixture setting determined from the maximum or peak EGT at power settings of 75% MCP and lower.

EGT °F is displayed with a vertical scale and pointer on the EIS ENGINE page. The numerical value for the EGT is located above the vertical scale.

Use the mixture control vernier adjustment to lean the fuel mixture by slowly turning the mixture control knob in the counterclockwise direction while monitoring EGT. As EGT °F increases, continue to lean the mixture until it reaches peak EGT. Enrichen the mixture by slowly turning the mixture control clockwise and monitor EGT °F until EGT decreases slightly.

NOTE

The Model 162 engine manufacturer, Teledyne Continental Motors, has not approved operation of the engine at fuel flow rates (mixture settings) less than necessary to reach peak EGT. Refer to Section 5, Figure 5-8, Cruise Performance, for specific power settings and lean for best power cruise.

Continuous operation at mixture settings lean of peak EGT is prohibited.

(Continued Next Page)

CRUISE (Continued)

LEANING WITH EXHAUST GAS TEMPERATURE (EGT) INDICATOR (if installed) (Continued)

CAUTION

EXCESSIVE LEANING WILL INCREASE ENGINE TEMPERATURES AND MAY DAMAGE ENGINE. WHEN INCREASING POWER, ENRICHEN MIXTURE, THEN ADVANCE THE THROTTLE TO INCREASE RPM. WHEN REDUCING POWER, RETARD THROTTLE, THEN ADJUST THE MIXTURE CONTROL.

NOTE

- Any change in altitude or power setting will require a change in the recommended lean mixture setting and a recheck of the EGT setting.
- The EGT indicator takes several seconds, after a mixture adjustment, to start to show an EGT change. Finding peak EGT and adjusting the mixture to the applicable setting should take approximately one minute when the adjustments are made carefully and accurately. Adjusting the mixture quickly is not recommended.

(Continued Next Page)

CRUISE (Continued)

FUEL SAVINGS PROCEDURES FOR FLIGHT TRAINING OPERATIONS

For best fuel economy during flight training operations, the following procedures are recommended.

1. After engine start and for all ground operations, set the throttle to 1200 RPM and lean the mixture for maximum RPM. After leaning, set the throttle to the appropriate RPM for ground operations. Leave the mixture at this setting until beginning the BEFORE TAKEOFF checklist. If TAKEOFF is delayed after completing the BEFORE TAKEOFF checklist, lean the mixture again as described above until ready to perform the TAKEOFF checklist.
2. Lean the mixture for maximum RPM during full throttle climbs above 3000 feet. The mixture may remain leaned (maximum RPM at full throttle) for practicing maneuvers such as stalls and slow flight.
3. Lean the mixture for maximum RPM during all operations at any altitude, including those below 3000 feet, when using 75% or less power.

NOTE

- When cruising or maneuvering at 75% power or less, the mixture may be further leaned to best power cruise. This is especially applicable to cross-country training flights, but should be practiced during transition flight to and from the practice area as well.
- Using the above recommended procedures can provide fuel savings in excess of 5% when compared to typical training operations at full rich mixture. In addition, the above procedures will minimize spark plug fouling since the reduction in fuel consumption results in a proportional reduction in tetraethyl lead passing through the engine.

STALLS

The stall characteristics are conventional for the flaps up and flaps down conditions and aural warning is provided by a Low Airspeed Alert and Stall Warning System horn which sounds between 8 and 15 knots above the stall in all configurations. Power-on stall recovery should be initiated by simultaneously lowering the nose while reducing power after which normal power-off stall recovery techniques should be applied.

CAUTION

INTENTIONAL POWER-ON STALLS SHOULD BE LIMITED TO 30 DEGREES NOSE UP PITCH ANGLE. EXCEEDING 30 DEGREES REQUIRES HIGH POWER AND ACCELERATED STALL ENTRY WHICH MAY RESULT IN DISORIENTATION.

WARNING

INTENTIONAL SPINS ARE PROHIBITED. REFER TO SECTION 3, EMERGENCY PROCEDURES, SPINS. IT IS RECOMMENDED THAT THESE EMERGENCY PROCEDURES BE MEMORIZED TO ENSURE PROMPT AND PROPER RECOVERY TECHNIQUES ARE USED IN THE EVENT AN INADVERTENT SPIN IS ENCOUNTERED.

Refer to Section 5, Figure 5-3, for power-off stall speeds at 1320 pounds.

DESCENT

Normal descent from altitude may be made with flaps retracted or with flaps extended to increase drag for a steepened descent angle. Caution should be used to observe flap limit speeds. Slips may be made in all flap configurations and are useful to increase descent rates while allowing power to be kept above idle. Carburetor heat should be used as needed for engine roughness and applied before reducing power to prevent carburetor ice from forming during low power descent. Since heated air causes a richer fuel mixture, readjust the mixture setting when carburetor heat is to be used for extended descent. If a low power descent is made, it is recommended that the throttle be cycled occasionally to check for engine roughness at higher power.

NOTE

Extended low power descents should be avoided during the first 25 hours of operation of a new engine.

LANDING

NORMAL LANDING

Normal landing approaches can be made with power on or power off with any flap setting within the flap airspeed limits. Surface winds and air turbulence are usually the primary factors in determining the most comfortable approach speeds. Slips to landing are very effective and may be performed in all flap configurations.

Landing at slower speeds will result in shorter landing distances and reduce wear to tires and brakes. The Low Airspeed Alert and Stall Warning System horn will sound as the airplanes slows for landing flair and touchdown. Pilot should monitor airspeed closely and be prepared to initiate stall avoidance procedures. Power should be at idle as the main wheels touch the ground. The main wheels must touch the ground before the nosewheel. The nosewheel must be lowered to the runway carefully after the speed has diminished to avoid unnecessary nose gear loads. This procedure is very important for rough or soft field landings. Directional control should be maintained using up to full rudder deflection and differential braking as necessary.

(Continued Next Page)

LANDING (Continued)

SHORT FIELD LANDING

For a short field landing in smooth air conditions, approach at 50 KIAS with FULL flaps using enough power to control the glide path. Slightly higher approach speeds should be used in turbulent air conditions.

NOTE

The Low Airspeed Alert and Stall Warning System horn will sound during short field landing approach to alert pilot of the low airspeed condition. Pilot should monitor airspeed closely and be prepared to initiate stall avoidance procedures.

After all approach obstacles are cleared, smoothly reduce power and hold the approach speed by lowering the nose of the airplane. The main wheels must touch the ground before the nosewheel with power at idle. Immediately after the main wheels touch the ground, carefully lower the nosewheel and apply heavy braking as required. For maximum brake performance, retract the flaps, hold the control stick full back, and apply maximum brake pressure without skidding the tires or loosing directional control. Use of full rudder authority will assist directional control.

CROSSWIND LANDING

When landing in a strong crosswind, use the minimum flap setting required for the field length. Sideslips with full rudder deflection, may be made in all flap configurations. Although the crab or combination method of drift correction may be used, the wing low method gives the best control. After touchdown, hold a straight course with the rudder and use up to full aileron deflection as required, and differential braking as necessary.

The maximum allowable crosswind velocity is dependent upon pilot capability as well as airplane limitations. Operation in direct crosswinds of 12 knots has been demonstrated (not an operating limitation).

(Continued Next Page)

LANDING (Continued)

BALKED LANDING

In a balked landing (go-around) climb, reduce the flap setting to 25° immediately after full power is applied and climb at 50 KIAS. Above 3000 feet pressure altitude, lean the mixture to obtain maximum RPM. After clearing any obstacles, allow the airplane to accelerate to 60 KIAS and carefully retract the flaps to 10°. After clearing any obstacles, carefully retract the flaps and allow the airplane to accelerate to normal climb airspeed.

HIGH WIND OPERATIONS

Takeoff and landings have been demonstrated in winds up to 22 knots and crosswinds up to 12 knots. The pilot should be cautious of gusts and turbulence from terrain or buildings when in close proximity to ground during takeoff and landing. Prompt and positive control inputs should be used to counter flight path deviations.

Proper taxi control techniques must be used at all times during ground operations. Operations in wind conditions above 22 knots are not recommended.

SECURING AIRPLANE

Refer to Section 8, Ground Handling, for information on Parking and Tiedown of the airplane.

COLD WEATHER OPERATIONS

Special consideration should be given to the operation of the airplane fuel system during the winter season or prior to any flight in cold temperatures. Proper preflight draining of the fuel system is especially important and will eliminate any free water accumulation. The use of additives such as isopropyl alcohol or Diethylene Glycol Monomethyl Ether (DIEGME) may also be desirable. Refer to Section 8, Fuel Additives, for more information on the proper use of fuel additives.

Cold weather often causes conditions that require special care during airplane operations. **Even small accumulations of frost, ice, or snow must be removed, particularly from wing, tail and all control surfaces to assure satisfactory flight performance and handling.** Also, control surfaces must be free of any internal accumulations of ice or snow.

If snow or slush covers the takeoff surface, allowance must be made for takeoff distances which will be increasingly extended as the snow or slush depth increases. The depth and consistency of this cover can, in fact, prevent takeoff in many instances.

The Garmin G300 Instrumentation Liquid Crystal Displays (LCD) may acquire a frosted or cloudy appearance at extremely cold temperatures. The displays may also be very slow to update information when cold soaked. Proper flight display clarity and flight data update rates may require extended warm-up.

The Garmin G300 EIS engine information is recommended for engine start due to possibility of engine damage resulting from inability to monitor engine upon start.

Takeoff is not recommended until displays are clearly legible and information updates (as indicated by heading change during taxi, RPM changes with throttle, etc) are shown in real-time without hesitation.

The Garmin G300 display warm-up is best accomplished by placing the airplane in a warm hangar and leaving the cabin doors open. If a hangar is not available, attach External Power (if installed) and set the MASTER Switch (BAT) and AVN MASTER Switch to the ON position. Allow display units to warm internally until legible and display controls (softkeys and knob) function normally when operated.

(Continued Next Page)

COLD WEATHER OPERATIONS (Continued)

NOTE

If external power is not available, do not attempt the self warming procedure. The battery will likely become depleted below the minimum voltage necessary for engine start.

External warm-air preheat may be applied to the cabin area. Use caution as excessively hot preheated air may damage interior or instrumentation. Due to fuel lines routed through cabin area, gas fired or exposed flame heaters should not be used to warm the cabin area.

STARTING

When air temperatures are below 20°F (-7°C), use an external preheater and an external power source, if external power receptacle is installed, whenever possible to obtain positive starting and to reduce wear and abuse to both the engine and electrical system. Preheat will thaw the oil trapped in the oil cooler, which probably will be congealed prior to starting in extremely cold temperatures.

WARNING

WHEN TURNING THE PROPELLER BY HAND, TREAT IT AS IF THE MAGNETOS SWITCH IS IN THE ON POSITION. A LOOSE OR BROKEN GROUND WIRE ON EITHER MAGNETO COULD ENERGIZE THE ENGINE.

Prior to starting on cold mornings, it is advisable to turn the propeller manually through several engine compression cycles by hand to loosen the oil, so the engine cranks (motors) more easily and uses less battery power. When the propeller is turned manually, turn it in the opposite direction to normal engine rotation for greater safety. Opposite rotation disengages the magneto impulse couplings and prevents possible unwanted ignition.

When using an external power source, the MASTER Switch (ALT and BAT) sections must be in the OFF position before connecting the external power source to the external power receptacle. Refer to Section 7, Starting Engine with External Power, for system description and operations.

(Continued Next Page)

COLD WEATHER OPERATION (Continued)

STARTING (Continued)

Cold weather starting procedures are the same as the normal starting procedures. Refer to Amplified Normal Procedures, Starting Engine in this section. The amount of fuel priming required for engine start is dependant upon temperature. The colder the engine, the more prime is required. In extremely cold temperatures, it may be necessary to continue priming while cranking the engine. If the engine is under primed it will not fire at all, and additional priming will be necessary. As soon as the cylinders begin to fire, open the throttle slightly to keep it running. Use caution to prevent inadvertent forward movement of the airplane during starting when parked on snow or ice.

CAUTION

HEAVY PRIMING AND THROTTLE PUMPING DURING START INCREASES THE RISK OF INDUCTION SYSTEM FIRE RESULTING FROM A BACKFIRE OR OTHER ABNORMALITY DURING START. IN THE EVENT OF AN ENGINE FIRE, CONTINUE CRANKING TO SUCK THE FLAMES INTO THE ENGINE. REFER TO SECTION 3, EMERGENCY PROCEDURES, FIRES, DURING START ON GROUND.

NOTE

If the engine does not start during the first few attempts, or if engine firing diminishes in strength, the spark plugs may be frosted over. Preheat must be used before another start is attempted.

(Continued Next Page)

COLD WEATHER OPERATION (Continued)

STARTING (Continued)

During cold weather operations, the oil temperature indicator may not be in the green band range when ready to perform the BEFORE TAKEOFF checklist if outside air temperatures are very cold. After a suitable warm up period of 2 to 5 minutes at 1000 RPM, slowly accelerate the engine to higher engine RPM. The engine should not exceed 1700 RPM until oil temperature indicates more than 75°F (24°C) and oil pressure is within the green band range (30 to 60 PSI). Once engine oil pressure and oil temperature reach normal operating range perform the BEFORE TAKEOFF checklist followed by a immediate takeoff. If engine is allowed to idle for a extended period of time between the completion of the BEFORE TAKEOFF checklist and prior to TAKEOFF, oil temperature may fall below 75°F (24°C) requiring a slow engine acceleration to warm the engine oil prior to performing TAKEOFF.

WINTERIZATION KIT

An optional winterization kit is available and may be utilized when cold weather operations are conducted. Refer to Section 9, Supplement 4 for installation and operational information.

HOT WEATHER OPERATIONS

Refer to the general warm engine starting information under Starting Engine in this section. Cabin doors may be left open for engine start and taxi if desired to aid cabin cooling. Face the airplane into the wind when possible for additional cooling airflow and avoid prolonged engine operation on the ground. Cabin doors must be closed for flight.

NOISE CHARACTERISTICS

The measured takeoff noise level for the Model 162 at 1320 pounds maximum weight is 70.8 dB(A) which complies with ICAO Annex 16 Chapter 10 (through Amendment 9) and 14 CFR 36 Appendix G (through Amendment 28) requirements.

No determination has been made that the noise levels of this airplane are, or should be, acceptable or unacceptable for operation at, into, or out of, any airport.

The following procedures are suggested to minimize the effect of airplane noise on the public:

1. Pilots operating airplanes under VFR over outdoor assemblies of persons, recreational and park areas, and other noise sensitive areas should make every effort to fly not less than 2000 feet AGL, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.
2. During departure from or approach to an airport, climb after takeoff and descent for landing should be made so as to avoid prolonged flight at low altitude near noise sensitive areas.

NOTE

The above recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgment, an altitude of less than 2000 feet AGL is necessary to adequately exercise the duty to see and avoid other airplanes.