

## Introduction

This section provides basic guidelines for normal operation of this airplane. The procedures contained herein are not intended to constitute basic flight instruction but are intended to supplement those principles relating to normal flight operations that each pilot acquires in the process of learning to fly and obtaining FAA pilot certification.

Checklists are provided to assist a pilot where it would be reasonable for a pilot to refer to one.

## Airspeeds For Normal Operation

Except as noted, the following speeds are based on a maximum weight of 3305 pounds and may be used at any lesser weight.

### Takeoff

Normal Initial Climb:	90-100 KIAS
Short Field Takeoff. Flaps 20°:	75 KIAS

### Enroute Climb, Flaps and Gear Retracted

Normal:	100-120 KIAS
Best rate of Climb, Sea Level to 6000 Feet:	100 KIAS
Best Rate of Climb, 10000 Feet:	99 KIAS
Best Rate of Climb, 15000 Feet:	97 KIAS
Best Angle of Climb, Sea Level:	75 KIAS
Best Angle of Climb. 8000 Feet:	78 KIAS

### Landing Approach

Normal Approach, Flaps Up:	90-100 KIAS
Normal Approach, Flaps 35°:	80-90 KIAS
Short Field Approach, Flaps 5°	75 KIAS

### Balked Landing

Maximum Power, Flaps 20°	75-80 KIAS
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### Maximum Recommended Turbulent Air Penetration Speed

3305 Lbs:	117 KIAS
3000 Lbs:	112 KIAS
2491 Lbs:	102 KIAS

### Maximum Demonstrated Crosswind Velocity

Takeoff or Landing:	19 Knots
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## Operational Checklist & Preflight Inspection

**Remove any accumulation of ice, snow, and/or frost from airplane prior to flight.**

### Cockpit

1. Pilot's Operating Handbook — AVAILABLE TO PILOT
2. Airplane documents — REVIEWED
3. Weight and Balance — CHECKED
4. Parking Brake — SET
5. Landing Gear Handle — DN
6. Ignition Switch — OFF
7. Electrical Switches — OFF
8. Avionics Master Switch — OFF
9. Circuit Buses — SET
10. Battery Master Switch. — ON

**Do not activate the airplane's electrical system when anyone is within or near the propeller's are to prevent potential injury, which could result from an electrical malfunction.**

11. Landing Gear Locked Lights —3 GREEN
12. Fuel Quantity Gauge — CHECK

**Do not activate the airplane's electrical system when anyone is within or near the propeller's are to prevent potential injury, which could result from an electrical malfunction.**

13. Cowl Flap — OPEN
14. Battery Master Switch — OFF
15. Rudder Trim — SET
16. Elevator Turn — SET

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**LEFT SIDE OF TAIL CONE AND EMPENNAGE**

1. Baggage Door — CLOSED & LOCKED
2. Static Port — UNOBSTRUCTED
3. Empennage — INSPECT
4. Rudder & Elevator — CHECK freedom of movement & security.
5. Trim Tabs — CHECK position & security
6. Rudder Gust Lock (if installed) — REMOVE
7. Tail Tie-Down — REMOVE

**RIGHT SIDE OF TAILCONE AND RIGHT WING TRAILING EDGE**

1. Static Port — UNOBSTRUCTED
2. Air conditioner Intake Door (if installed) — CLOSED
3. Wing Flap — INSPECT
4. Aileron — CHECK freedom of movement & security.

**RIGHT WING LEADING EDGE**

1. Fuel Vent — UNOBSTRUCTED
2. Fuel Quantity CHECK VISUALLY for level & agreement with gauge.
3. Fuel Filler Cap — SECURE
4. Wing Tie-Down — REMOVE
5. Fuel Tank Sump — DRAIN AT LEAST 1 CUPFUL visually inspect fluid for water, sediment, proper grade (color). Check valve CLOSED.

**All fuel system drains should be sampled daily and after each refueling, to assure proper fuel and lack of contamination. If contamination is found, continue draining from all sample points until fuel is clean.**

6. Right Main Gear. Tire, & Wheel Well — INSPECT
7. Gear Safety & Stall Warn Disable Squat Switch — INSPECT
8. Landing Gear Limit Switches (2) — INSPECT
9. Chocks — REMOVE
10. Right Wheel Well Fuci Drain — DRAIN AT LEAST 1 CUPFUL, visually inspect fluid for water, sediment proper grade (color) Check valve CLOSED.

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## **NOSE**

1. Cowl Flap — CHECK POSITION & SECURITY
2. Fuel Gascolator — DRAIN AT LEAST 1 CUPFUL, visually inspect fluid for water, sediment, proper grade (color). Check valve —CLOSED
3. Nose Gear, Tire, & Wheel Well —INSPECT
4. Chocks — REMOVE
5. Right Engine Cooling Air Inlet — UNOBSTRUCTED
6. Engine Induction Air Inlet — CLEAR
7. Left Engine Cooling Air Inlet — UNOBSTRUCTED
8. Propeller & Spinner — INSPECT
9. Heater Air Inlet—CLEAR
10. Oil quantity CHECK, minimum 7 quarts
11. Exhaust Tailpipe — CHECK SECURE

## **LEFT WING LEADING EDGE**

1. Left Wheel Well Fuel Drain — DRAIN AT LEAST 1 CUPFUL visually inspect fluid for water, sediment, proper grade (color). Check valve — CLOSED.
2. Left Main Gear, Tire, & Wheel Well — INSPECT
3. Chocks — REMOVED
4. Fuel Tank Sump DRAIN AT LEAST 1 CUPFUL, visually inspect fluid for water, sediment. proper grade (color). Check valve CLOSED.
5. Wing Tie-Down — Remove
6. Fuel Quantity — CHECK VISUALLY for Level & agreement with gauge.
7. Fuel Filler Cap — SECURE
8. Pitot Port (on mast) — UNOBSTRUCTED
9. Fuel Vent — UNOBSTRUCTED

## **LEFT WING TRAILING EDGE**

1. Aileron — CHECK freedom of movement & security.
2. Wing Flap — INSPECT

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## Before Starting Engine

1. Preflight Inspection — COMPLETE
2. Seats. Seat Belts. & Shoulder Harnesses — ADJUST & SECURE
3. Landing Gear Handle — DN
4. Electrical Switches — OFF
5. Avionics Master Switch — OFF

**WARNING!**  
**Failure to keep avionics master switch OFF during engine starts may cause damage to avionics.**

6. Circuit Breakers — SET
7. Brakes — TEST & SET

## Starting Engine

### NORMAL START

1. Throttle — OPEN 1/2 INCH
2. Propeller Control HIGH RPM
3. Mixture — 50%
4. Propeller Area — CLEAR
5. Battery Master & Alternator Master Switches — ON
6. Landing Gear Locked Lights — 3 GREEN
7. Cowl Flap — OPEN
8. Voltmeter — CHECK battery up 20- 24 volts
9. Auxiliary Fuel Pump Switch
  - For cold starts:** Auxiliary Fuel Pump Switch ON and proceed with steps 10 and 11
  - For hot start:** Auxiliary Fuel Pump Switch — OFF and proceed to Step 11
10. Fuel Pressure — GREEN ARC (20-65 psi)
11. Mixture—
  - For cold start:** FULL RICH for 4 -6 seconds~ then IDLE CUT-OFF
  - For hot start:** LEAVE IN IDLE CUTOFF
12. Auxiliary Fuel Pump Switch — OFF
13. Ignition Switch — START
14. Ignition Switch — RELEASE TO BOTH as engine starts

**NOTE**  
**Cranking should be Limited to 10 to 12 seconds and several minutes allowed between cranking periods to allow starter cooling.**

15. Mixture ADVANCE SLOWLY TO I FULL RICH as engine starts or after approximately 5 seconds of cranking.
16. Throttle—SET FOR 800 - 1000 RPM
17. Oil Pressure — CHECK
18. Alternator Master Switch (External Power Start) — ON after External Power disconnected
19. Ammeter — CHECK for charging indication
20. Voltmeter — CHECK for 28 volt nominal.

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21. Low Volts Annunciator — OFF

### **FLOODED START**

1. Throttle — FULL OPEN
2. Propeller Control — HIGH RPM
3. Mixture — 50%
4. Propeller Area — CLEAR
5. Battery Master & Alternator Master Switches — ON

**NOTE**  
**For external power assisted start alternator master switch should be left OFF until external power is disconnected**

6. Landing Gear Locked Lights — 3 GREEN
7. Cowl Flap — OPEN
8. Voltmeter — CHECK battery up, 20-24. Volts
9. Auxiliary Fuel Pump Switch — OFF
10. Ignition Switch — START
11. Ignition Switch — RELEASE TO BOTH as engine starts.
12. Throttle — RETARD to 800 - 1000 RPM as engine starts.
13. Mixture — ADVANCE SLOWLY TO FULL RICH as engine starts.

**NOTE**  
**Cranking should be limited to 10 to 12 seconds and several minutes allowed between cranking periods to allow starter cooling.**

14. Throttle — SET FOR 800 - 1000 RPM
15. Oil Pressure — CHECK
16. Alternator Master Switch (External Power Start) — ON after External Power disconnected
17. Ammeter — CHECK for charging indication
18. Voltmeter — CHECK for 28 volt nominal
19. Low Volt Annunciator — OFF

### **Before Taxi**

1. Beacon — ON
2. Avionics Master Switch — ON
3. Radios — SET
4. Parking Brake — RELEASE

### **Taxi**

1. Brakes — CHECK
2. Nose Wheel Steering — CHECK
3. Compass — CHECK against known taxiway heading.

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## **Before Takeoff**

1. Parking Brake — SET
2. Seats, Seat Belts, Shoulder Harnesses — CHECK SECURE
3. Flight Controls — FREE & CORRECT movement
4. Instruments — CHECK & SET
5. Fuel Quantity — RECHECK adequate for planned flight
6. Auxiliary Fuel Pump Switch — ON
7. Mixture — FULL RICH
8. Rudder Trim — SET for takeoff.
9. Elevator Trim — SET for takeoff
10. Throttle — 2000 RPM
11. Magnetos — CHECK (R, BOTH L, BOTH)

**NOTE**  
**RPM drop should not exceed 175 on either magneto nor 50 differential between the magnetos**

12. Propeller Control — CYCLE from HIGH RPM to LOW RPM; return to HIGH RPM (full forward)
13. Engine Instruments — CHECK
14. Suction Gauge — CHECK vacuum
15. Throttle — 1000 RPM
16. Cowl Flap — RECHECK OPEN
17. Wing Flaps — SET per takeoff checklist
18. Cabin Doors CLOSED & LATCHED (both lower & upper latches)
19. Position Lights — ON
20. Brakes — RELEASE

## **Takeoff**

### **NORMAL TAKEOFF**

1. Wing Flaps — 10° (recommended)
2. Power — FULL. THROTFLE & 2575 RPM
3. Mixture — FULL RICH
4. Elevator Control — ROTATE AT 70 KIAS
5. Initial Climb Speed — 90 to 100 KIAS
6. Brakes — APPLY momentarily.
7. Landing Gear — RETRACT
8. Wing Flaps — RETRACT (if extended)

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### **SHORT FIELD TAKEOFF**

1. Wing Flaps — 20°
2. Brakes — APPLY & HOLD
3. Power — FULL THROITLE & MAX RPM
4. Mixture — FULL RICH
5. Brakes — RELEASE
6. Elevator Control — ROTATE AT 70 KIAS
7. Climb Speed —75 KIAS until obstacles cleared, then increase.
8. Brakes -- APPLY momentarily.
9. Landing Gear — RETRACT after obstacles cleared.
10. Wing Flaps RETRACT after airspeed reaches 80 KIAS.

### **Enroute Climb**

#### **NORMAL CLIMB**

1. Airspeed— 100 to 120 KIAS
2. Power —29 In. Hg & 2400 RPM
3. Mixture —23 GPH or FULL RICH
4. Cowl Flap — OPEN as required.

#### **MAXIMUM PERFORMANCE CLIMB**

1. Airspeed — 100 KIAS at sea level to 6000 ft.
2. Power— FULL THROTTLE & 2575 RPM
3. Mixture — FULL RICH
4. Cowl Flap — OPEN

### **Cruise**

1. Power—15 to 29 In. Hg & 2200 to 2400 RPM
2. Mixture — LEAN (with power at or below 75%) to peak T.I.T. or 1650 ° F whichever is less
3. Elevator & Rudder Thin — ADJUST
4. Auxiliary Fuel Pump Switch — OFF, check fuel pressure.
5. Cowl Flap — CLOSED, unless engine temperatures are excessive
6. Fuel Selector Valve — AS REQUIRED to maintain lateral trim
7. Power — AS DESIRED
8. Mixture — ADJUST if required for smooth operation
9. Cowl Flap — CLOSED
10. Wing Flaps — AS DESIRED (0° to 20° below 149 KIAS, 20° to 25° below 121 KIAS, 25° to 35°below 112 KIAS)

**NOTE**

**The landing gear may be extended below 129 KIAS to increase descent rate. Further increase may be achieved by accelerating to  $V_{NE}$  with the gear down and flaps fully retracted**

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## **Before Landing**

1. Seats, Seat Belts. Shoulder Harnesses — SECURE
2. Auxiliary Fuel Pump Switch — ON
3. Landing Gear — EXTEND. 3 GREEN
4. Mixture — FULL RICH
5. Propeller — HIGH RPM

## **Landing**

### **NORMAL LANDING**

1. Airspeed —90 to 100 KIAS, flaps 0°
2. Wing Flaps — AS DESIRED (35° recommended)
3. Airspeed — 80 to 90 KIAS, flaps 35°
4. Trim — ADJUST as required.
5. Gear — CHECK 3 GREEN
6. Touchdown MAIN WHEELS FIRST
7. Braking — MINIMUM required

**CAUTION**  
**This airspeed is recommended in smooth air only. Increase as required for actual conditions. Expect increased landing distances.**

### **SHORT FIELD LANDING**

1. Airspeed 90 to 100 KIAS, flaps 0°
2. Wing Flaps — 35°
3. Airspeed — 75 KIAS
4. Trim — ADJUST as required
5. Gear — CHECK 3 GREEN
6. Power — REDUCE TO IDLE at or before crossing obstacle.
7. Touchdown — MAIN WHEELS FIRST
8. Braking — HEAVY
9. Wing Flaps — RETRACT for maximum braking

### **BALKED LANDING**

1. Power — FULL THROTTLE & 2575 RPM
2. Wing Flaps — RETRACT TO 20°
3. Airspeed —70 to 80 KIAS

When positive rate of climb is established:

4. Landing Gear — RETRACT

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5. Wing Flaps — RETRACT SLOWLY as airspeed is increased to normal climb speed.
6. Cowl Flap — OPEN

### **After Landing**

1. Auxiliary Fuel Pump Switch -~- OFF
2. Strobe Lights OFF
3. Cowl Flaps — OPEN
4. Wing Flaps — UP

### **Shutdown**

**NOTE!**  
**Allow engine to idle for 2 to 3 minutes prior to engine shut down  
to prevent coking and allow turbocharger to cool**

1. Throttle— IDLE
2. Parking Brake — SET
3. Electrical Equipment — OFF
4. Avionics Master Switch — OFF
5. Mixture — IDLE CUT-OFF
6. Ignition Switch — OFF
7. Battery Master & Alternator Master Switches — OFF