

VNE	163	V50	40
VNO	129	Vs	48
VA	105	Vx	62
VFE	85	Vy	74

**All Speeds are in KIAS**

One 180 BHP, Lycoming, Fuel Injected, 4 cylinder,  
 Direct Drive, Air cooled, Horizontally Opposed, 53 gals  
 usable fuel, 8qts (6 min) Oil.

Max Ramp: 2558 Empty (General): 1663  
 Max Load: 2550 Useful Load: 887

**ENGINE FAILURES:**

**DURING TAKEOFF RUN:**

- Throttle – Idle
- Brakes – Apply
- Flaps – Retract
- Mixture – Idle Cutoff
- Ignition Switch – Off
- Battery Switch – Off

**IMMEDIATELY AFTER TAKEOFF:**

- Airspeed – 65 KIAS (Flaps Down)
- 70 KIAS (Flaps Up)

**IDENTIFY LANDING AREA**

- Fuel Selector – Off
- Mixture – Idle Cutoff
- Flaps – As Required
- Ignition – Off
- Battery Switch – Off
- Doors – Unlatch
- Land Straight Ahead

**DURING FLIGHT:**

- Airspeed – 68 KIAS

**IDENTIFY LANDING AREA**

- Fuel Selector – Both
- Fuel Shutoff Valve – Push In
- Mixture – Rich
- Fuel Pump – On
- Ignition – Both

**FORCED LANDINGS:**

**NO POWER:**

- Airspeed – 65 KIAS (Flaps Down)
- 70 KIAS (Flaps Up)
- Seats/ Seat Belts – Secure
- Fuel Shutoff Valve – Pull Out
- Mixture – Idle Cutoff
- Flaps – As Required
- Ignition – Off
- Battery Switch – Off
- Doors – Unlatch
- Touchdown – Slightly Tail Low
- Brakes – Apply Heavily

**WITH POWER:**

- Airspeed – 65 KIAS
- Seats/ Seat Belts – Secure
- Flaps – 20°
- Landing Area – Terrain and Obstacles
- Radios/ Electrical – Off
- Flaps – 30°
- Battery Switch – Off
- Doors – Unlatch
- Touchdown – Slightly Tail Low
- Ignition – Off
- Brakes – Apply Heavily

**DITCHING:**

- Radio – 121.5
- Squawk – 7700
- Heavy Objects – Stow
- Seats/ Seat Belts – Secure
- Flaps – 20° to 30°
- Power – 300 FPM/ 55 KIAS
- Doors – Unlatch
- Touchdown – Level
- Airplane – Evacuate

**AIRCRAFT FIRES:**

**FIRE DURING START:**

Continue Cranking

**IF ENGINE STARTS:**

- Power – 1800 RPM
  - Engine – Shutdown/ Inspect
- IF ENGINE FAILS TO START:**
- Continue Cranking

- Fuel Shutoff Valve – Pull Out
- Mixture – Idle Cutoff
- Throttle – Full Open
- Ignition – Off
- Battery Switch – Off
- Fire Extinguisher – Obtain
- Fire – Extinguish
- Fire Damage – Inspect

**FIRE DURING FLIGHT:**

- Fuel Shutoff Valve – Pull Out
- Mixture – Idle Cutoff
- Cabin Heat/ Air – Closed
- Battery Switch – Off
- Airspeed – 100 KIAS
- Forced Landing – Execute

**ELECTRICAL FIRES:**

- Battery Switch – Off
- Vents/ Cabin Heat/ Air – Closed
- Fire Extinguisher – Activate
- Avionics – Off
- Electrical Switches – Off
- Vent Cabin – Open Windows
- Battery Switch – On
- Circuit Breakers – Do Not Reset
- Avionics – On (one at a time)

**CABIN FIRE:**

- Battery Switch – Off
- Vents/ Cabin Heat/ Air – Closed
- Fire Extinguisher – Activate
- Flight – Terminate ASAP

**WING FIRE:**

- Perform a Sideslip to keep flames away from fuel tanks/ cabin
- Exterior Lights – Off
- Pitot Heat – Off
- Flight – Terminate ASAP

**ABNORMAL PROCEDURES:**

**LANDING WITH FLAT MAIN TIRE:**

- Approach – Normal
- Flaps – As Required
- Touchdown – Good Tire First
- Brakes – Apply (Differential Braking)

**LANDING WITH FLAT NOSE TIRE:**

- Approach – Normal
- Flaps – As Required
- Touchdown – Mains First
- Maintain Full Up Elevator

**AMMETER EXCESSIVE CHARGE:**

- Alternator – Off
- Alternator Circuit Breaker – Pull
- Nonessential Equipment – Off
- Flight – Terminate ASAP

**LOW VOLTAGE LIGHT:**

- Avionics Power Switch – Off
  - Alternator Circuit Breaker – Off
  - Battery/ Alternator – Off
  - Battery/ Alternator – On
  - Low Voltage Light – Check Off
  - Avionics Power Switch – On
- IF LIGHT ILLUMINATES AGAIN:**
- Alternator – Off
  - Nonessential Radios – Off
  - Flight – Terminate ASAP

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One 180 BHP, Lycoming, Fuel Injected, 4 cylinder, Direct Drive, Air cooled, Horizontally Opposed, 53 gals usable fuel, 8qts (6 min) Oil.

Max Ramp: 2558 Empty (General): 1663  
 Max Land: 2550 Useful Load: 887

**FLOODED START:**  
 If engine has been primed too much, turn off fuel pump, place mixture to idle cutoff, open throttle to full, engage starter. When engine starts, set mixture to full rich and close throttle promptly and continue checklist.

**HOT START:**  
 If engine is warm do not prime, open throttle 1/2 inch, mixture idle cutoff, engage starter. Slowly advance mixture to full rich. If engine does not start, flood the system with full mixture and full throttle while turning on the fuel pump for longer than normal. Then use the flooded start procedure.

**TAXI CHECK:**  
 Brakes - Test (With Engine Idle)  
 Turn Coordinator - Direction of Turn

**BEFORE TAKEOFF:**

- Brakes - Hold
- Fuel - On Both
- Fuel Quantity - Check
- Trim - Set for Takeoff
- Throttle - 1800 RPM
- Mixture - Set (Best Power)
- Magnetos - Check (Max drop 150 RPM/Min drop 50 RPM)
- Alternator Output - Check
- Engine Gauges - Check
- Fuel Gauges - Check
- Gyro Source Gauge - Check
- Throttle - Idle
- PFD - No Red X's
- Annunciator Panel - No Flags
- PFD Baro - Set
- STBY Alt. Baro - Set
- KAP 140 Baro - Set
- Speed and Alt. SEL - Set
- Standby Flight Instruments - Check
- Radios - Set
- CDI Soft key - Select NAV source
- Flight Controls - Free and Correct
- Seats/ Seat belts - Secure
- Cabin Doors/ Windows - Latched
- Brakes - Release

**CLEARED TAKEOFF/ POS. & HOLD:**  
 Lights - As Required  
 Autopilot - Off  
 Flaps - 0° to 10°  
 Time - Note

**BEFORE STARTING ENGINES:**

- Preflight Insp. - Complete
- Passenger Briefing - Complete
- Seat Belts - Fasten/ Adjust
- Brake - Test and Set
- Fuel - On Both
- Fuel Shutoff Valve - Check In
- Circuit Breakers - In
- Electrical & Avionics Switch - Off

**STARTING ENGINES:**

- STBY BATT Switch - Test (hold for 3 seconds, verify that green TEST lamp illuminates), ARM (verify PFD comes on)
- Engine Indicating System - Check parameters, (verify no red X's through ENGINE page indicators)
- BUS E Volts - Verify minimum 24 VOLTS
- BUS M Volts - Verify 1.5 volts or less
- BATT S Amps - Verify Discharge
- STBY BATT Annunciator - Verify ON
- Mixture - Rich
- Throttle - Full Open
- Battery Switch - On
- Fuel Pump - On (Until Pressure is Stable)
- Fuel Pump - Off
- Mixture - Idle Cutoff
- Throttle - 1/8" Open
- Propeller - Clear
- Starter - Engage
- Mixture - Advance to Rich
- Throttle - Below 1000 RPM
- Mixture - Lean
- Oil Pressure - Check
- AMPS (M BATT and BATT S) - Check charge (positive)
- LOW Volts Annunciator - Out
- Avionics - On
- Beacon - On
- Flaps - Retract

**LANDING:**

- Normal Landing:  
 Flaps - As Required  
 Airspeed - 60 to 70 KIAS  
 Aim Point - Runway Numbers  
 Touchdown - Mains First
- Short Field Landing:  
 Airspeed - 65 to 75 KIAS  
 Flaps - 30°  
 Airspeed - 61 KIAS (Short Final)  
 Aim Point - Runway Numbers  
 Touchdown - Mains First  
 Brakes - Apply

**BALKED LANDING:**

- Throttle - Full Open
- Flaps - 20°
- Airspeed - 60 KIAS
- Establish Positive Rate
- Flaps - 10°
- Airspeed - 65 KIAS
- Flaps - 0°

**AFTER LANDING:**

- Clear of Runway:  
 Throttle - Retract  
 Throttle - Idle/ 1000 RPM  
 Lights - As Required

**Shutdown**

- ELT 121.5 - Check/ Monitor
- Avionics - Off
- Electrical Equipment - Off
- Throttle - Idle
- Mixture - Idle Cutoff
- Magnetos - Off
- Battery/Alternator - Off
- Tach/Hobbs Time - Note
- STBY BATT - Off

**Parking**

- Controls - Locked
- Tiedowns - Secure
- Propeller - Level

**TAKEOFF:**

- Normal Takeoff:  
 Flaps - 0° to 10°  
 Throttle - Smoothly to Max Pwr  
 Gauges - Check Green  
 Rotate - 55 KIAS  
 Airspeed - 70 to 80 KIAS
- Short Field Takeoff:  
 Flaps - 10°  
 Brakes - Hold  
 Throttle - Smoothly to Max Pwr  
 Gauges - Check Green  
 Brakes - Release  
 Rotate - 55 KIAS  
 Airspeed - 56 KIAS Through 50'  
 Airspeed - 70 to 80 KIAS  
 Flaps - 0°

**1000' AGL CHECK:**

- Cruise Climb - 70 to 85 KIAS
- Throttle - Set
- Mixture - Set
- Lights - As Required

**CRUISE CHECK:**

- Throttle - Set
- Mixture - Set
- Engine Gauges - Check

**DESCENT:**

- Flaps - Retract
- Mixture - Richen
- Throttle - As Required
- Lights - As Required
- Altimeter - Set
- CDI Soft Key - Select NAV Source

**APPROACH:**

- Fuel - On Both
- Flaps - As Required
- Mixture - Set
- Throttle - As Required
- Lights - As Required
- Autopilot - Off
- Seat Belts - Erect
- Seat Belts - Fasten