

V _{SO}	48 MPH	V _{BG}	75 MPH
V _S	55 MPH	V _{A @ max weight}	109 MPH
V _R	55 MPH	V _{FE}	100 MPH
V _X	70 MPH	V _{NO}	120 MPH
V _Y	78 MPH	V _{NE}	162 MPH

Before Starting Engine

- 1) Preflight inspection – COMPLETE
- 2) Towbar – STOWED
- 3) Fuel caps – ON & SECURE
- 4) Pitot cover – REMOVED
- 5) Control lock – REMOVED
- 6) Documents – ON BOARD
- 7) Hobbs & tach – RECORDED
- 8) Airplane keys – ON DASH
- 9) Pax & PIC briefing – COMPLETE
- 10) Seats & seatbelts – ADJUSTED
- 11) Brakes – TEST & SET
- 12) Avionics & electrical equipment – OFF
- 13) Circuit breakers – CHECK IN
- 14) Fuel shutoff valve – ON
- 15) Doors – CLOSED & LOCKED

Starting Engine

- 1) Primer
 - Engine Cold – 2-3 strokes, locked
 - Engine Hot – 0-1 strokes, locked
- 2) Carb heat – COLD
- 3) Throttle – OPEN ¼ inch
- 4) Mixture – RICH
- 5) Master switch – ON
- 6) Beacon/strobes – ON
- 7) Propeller area – “CLEAR” and visually clear area
- 8) Ignition – START, slowly advance throttle, release after start
- 9) Throttle – SET 800 to 1000 RPM
- 10) Oil pressure – CHECK GREEN within 30 seconds

After Start

Look around and move if people are waiting.

Don't block the ramp!

- 1) Ammeter – CHECK slightly positive
- 2) Avionics – ON
- 3) Mixture – LEAN for taxi, slightly rich of engine roughness
- 4) Flaps – UP, visually confirm
- 5) Transponder – ALT & 1200
- 6) ATIS/AWOS/ASOS – CHECK
- 7) Flight instruments – SET (altimeter near FE)
- 8) Radios – SET, CONTACT GROUND

Taxi

- 1) Brief taxi diagram & hot spots
- 2) Brakes – CHECK gently
- 3) Flight instruments – CHECK OPERATION

Run-up

- 1) Nosewheel straight, brakes held tight
- 2) Flight Controls – FREE & CORRECT
- 3) Trim – SET FOR TAKEOFF (yoke aft, trim flush with elevator)
- 4) Flight instruments – CHECK & SET
- 5) Doors & windows – CLOSED & LATCHED
- 6) Primer – IN & LOCKED
- 7) Mixture – RICH
- 8) Throttle – 1700 RPM
- 9) Magnetos – TEST R, BOTH, L, then BOTH (max. 75 RPM differential)
- 10) Carb heat – CHECK HOT, note RPM drop, then COLD
- 11) Engine instruments – CHECK
- 12) Ammeter – CHECK (do not cycle the alternator!)
- 13) Throttle – IDLE (500-800 RPM), then 800-1000
- 14) Throttle friction – ADJUSTED
- 15) GPS/NAV – SET
- 16) Takeoff briefing – COMPLETE

“This will be a normal/short-field (soft-field) takeoff, flaps up (10°), departing runway ____ with a climb to ____ feet. V_R is 55, V_X is 70, and V_Y is 78 MPH. For any abnormality with runway remaining, I will call “abort, abort,” reduce the throttle to idle, and bring the aircraft to a stop on the runway. For an engine failure below 400’ AGL, I will land straight ahead. I will not attempt to return to the runway until reaching a safe altitude. For any abnormality or emergency I will aviate, navigate, communicate, and run the appropriate checklist. Best glide is 75. Any questions?”

Before Take-off

- 1) Lights – AS NEEDED
- 2) Transponder – ALT & squawk code
- 3) Flaps – UP for normal/short-field takeoff (10° for soft-field)
- 4) Mixture – RICH (or set for DA)
- 5) Carb heat – COLD
- 6) Trim – SET FOR TAKEOFF
- 7) Fuel – CHECK quantity, fuel selector ON, primer LOCKED
- 8) Seats & seatbelts – ADJUSTED
- 9) Doors & windows – CLOSED & LATCHED
- 10) Radios – SET & CONTACT TOWER

Normal Takeoff

- 1) Flaps – UP, visually confirm
- 2) Throttle – Smoothly to FULL FWD
- 3) Engine instruments – CHECK
- 4) Elevator – Lift nosewheel at 55 MPH
- 5) Climb – 70 to 80 MPH until 1000’ AGL & clear of obstacles, then climb at 75 to 85 MPH

Enroute Climb (at 1000' AGL & clear of obstacles)

- 1) Airspeed – 75 to 80 MPH (climb at 80+ on hot days)
- 2) Engine instruments – MONITOR
- 3) Mixture – RICH***

Cruise

- 1) Throttle – 2100 to 2400 RPM (< 70% power)
- 2) Engine instruments – CHECK
- 3) Mixture – If engine temp normal, LEAN for altitude
- 4) Trim – SET for cruise airspeed
- 5) Fuel selector – ON
- 6) Flight instruments – CHECK

Descent

- 1) ATIS/AWOS/ASOS – CHECK
- 2) Flight instruments – CHECK & SET
- 3) Radios – SET, report 10 miles out
- 4) Approach/pattern entry briefing – COMPLETE
- 5) Carb heat – ON if required
- 6) Throttle – REDUCE for descent
- 7) Mixture – ADJUSTED for altitude
- 8) Seats & seatbelts – ADJUSTED

Before Landing

- 1) Lights – AS NEEDED
- 2) Fuel – CHECK quantity, fuel selector ON, primer LOCKED
- 3) Carb Heat – ON before closing throttle
- 4) Mixture – RICH
- 5) Airspeed – 75 MPH flaps UP
- 6) Airspeed – 65 MPH flaps DOWN

After Landing (stop once clear of runway)

- 1) Radio – Switch to GROUND when advised
- 2) Flaps – UP, visually confirm
- 3) Mixture – LEAN for taxi
- 4) Carb Heat – COLD
- 5) Lights – AS NEEDED
- 6) Trim – SET FOR TAKEOFF
- 7) Transponder – ALT & 1200
- 8) Radios – CONTACT GROUND

Shutdown

- 1) Avionics and electrical switches – OFF
- 2) Throttle – 1000 RPM
- 3) Mixture – IDLE CUTOFF
- 4) Ignition – OFF, key on dash
- 5) Master switch – OFF
- 6) Control lock & sunshade – INSTALL
- 7) Pitot cover – INSTALL
- 8) Hobbs & tach – RECORD
- 9) Trash – REMOVE & TIDY UP
- 10) Tiedowns & chocks – INSTALL
- 11) Doors – LOCK

*****Operating on hot days:**

If oil temp and/or EGTs are warmer than normal, do not lean during climb. Use a higher enroute climb speed as soon as possible for better cooling. Mixture may be leaned slightly during climb above 5000' if engine temps are cool/normal.

Soft-field Takeoff

- 1) Flaps – 10°
- 2) Elevator – FULL AFT
- 3) Brakes – Minimize use
- 4) Throttle – Smoothly to FULL FWD
- 5) Engine instruments – CHECK
- 6) Elevator – Maintain nose high/tail low until liftoff
- 7) Climb – Remain in ground effect until 70 MPH, then begin climb* and accelerate to V_Y 78 MPH
- 8) Flaps – RETRACT

* If obstacles are present: climb at 70 MPH until clear, then accelerate to V_Y and retract flaps.

Normal and Soft-field Landing

- 1) Flaps – 30° (or less, as needed with a crosswind)
- 2) Airspeed – PITCH for 65 MPH
- 3) Throttle – ADJUST for descent rate
- 4) Touchdown – MAIN WHEELS FIRST
- 5) Elevator – Increase gradually to FULL AFT during deceleration
- 6) Brakes – Minimize use

Max. Performance Short-field Takeoff (obstacle)

- 1) Flaps – UP
- 2) Brakes – HOLD
- 3) Throttle – Smoothly to FULL FWD
- 4) Engine instruments – CHECK
- 5) Brakes – RELEASE
- 6) Elevator – Lift nosewheel at 55 MPH
- 7) Climb – V_X 70 MPH until clear of obstacles, then accelerate to cruise climb of 75 to 85 MPH

Min. Ground Run Takeoff (short runway)

- 8) Flaps – 10°
- 9) Brakes – HOLD
- 10) Throttle – Smoothly to FULL FWD
- 11) Engine instruments – CHECK
- 12) Brakes – RELEASE
- 13) Elevator – Lift nosewheel at 55 MPH
- 14) Climb – Accelerate to 70-80 MPH
- 15) Flaps – Retract and resume normal climb

Short-field Landing

- 1) Flaps – 40°
- 2) Airspeed – PITCH for 60 MPH
- 3) Throttle – ADJUST for descent rate
- 4) Touchdown – MAIN WHEELS FIRST
- 5) Brakes – APPLY, but do not skid tires!
- 6) Flaps – RETRACT

Refer to POH Section II, Description and Operating Details, and Section VI, Operational Data, to make adjustments for variations in conditions and to calculate takeoff & landing data.