V_S	55 MPH	V_{BG}	69 MPH
V_{S0}	48 MPH	$V_{A\ @\ max\ weight}$	112 MPH
V_R	50 MPH	V_{FE}	100 MPH
V_X	64 MPH	V_{NO}	120 MPH
V_Y	73 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) Passenger briefing – COMPLETE
10) Seats & seatbelts – ADJUSTED
11) Brakes – TEST & SET
12) Avionics & electrical equipment – OFF
13) Circuit breakers – CHECK IN
14) Fuel selector – BOTH
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) Suction gauge – CHECK
14) Throttle – IDLE (500-800 RPM), then 800-1000
15) Throttle friction – ADJUSTED
16) GPS/NAV – SET
17) 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 50, V_X is 64, and V_Y is 73 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 69. 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 on BOTH, 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 50 MPH
5) Climb – V_Y 73 until 1000' AGL & clear of obstacles, then climb at 80 MPH

Enroute Climb (at 1000' AGL & clear of obstacles)
1) Airspeed – 75 to 80 MPH*
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 – BOTH
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 on BOTH, 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

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 to accelerate, then climb at V_Y 73 MPH
8) Flaps – RETRACT above 70 MPH

* If obstacles are present, climb at V_X 64 MPH until clear of all obstacles before accelerating to V_Y.

Normal and Soft-field Landing
1) Flaps – 30°
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

Short-field Takeoff
1) Flaps – UP
2) Brakes – HOLD
3) Throttle – Smoothly to FULL FWD
4) Engine instruments – CHECK
5) Brakes – RELEASE
6) Elevator – Lift nosewheel at 50 MPH
7) Climb – V_X 64 MPH until clear of obstacles
8) Accelerate – 73 to 80 MPH

Short-field Landing
1) Flaps – 40°
2) Airspeed – PITCH for 58 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 V, Operational Data, to make adjustments for variations in conditions and to calculate takeoff & landing data.

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