

Ground Checklists and Information

Preflight		
Fluids		
Magnetos	OFF	
Fuel quantity	CHECK VISUALLY	
Fuel sumps	DRAIN	
Left wing, right wing, fuel strainer. Inspect for contamination.		
Fuel filler caps	SECURE	
Engine oil level	CHECK	
Minimum 6 quarts		
Cabin		
Pitot cover	REMOVE	
POH	VERIFY PRESENT	
Master	ON	
Flaps	EXTEND	
Fuel gauges	CHECK QUANTITY	
Lights	CHECK	
Tach time	RECORD	
Pitot heat	TEST	
Master	OFF	
Fire extinguisher	SECURE	
Control lock	REMOVE	
Empennage		
Rudder gust lock	REMOVE	
Control surfaces	CHECK	
Freedom of movement and security		
Right		
Main wheel tire	CHECK INFLATION	
Aileron	CHECK	
Freedom of movement and security		
Nose		
Propeller, spinner	CHECK	
For nicks and security		
Landing light	CHECK CLEAR	
Air filter	CHECK CLEAR	
Nosewheel & strut	CHECK INFLATED	
Static source	CHECK CLEAR	
Left		
Main wheel tire	CHECK INFLATION	

Light Gun Signals		
Aircraft on the Ground		Aircraft in Flight
Cleared for takeoff		Cleared to land
Cleared for taxi		Return for landing (to be followed by steady green at the proper time)
STOP		Give way to other aircraft and continue circling
Taxi clear of the runway in use		Airport unsafe, do not land
Return to starting point on airport		Not applicable
Exercise extreme caution		Exercise extreme caution

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Preflight (continued)		
Fuel tank vent	CHECK CLEAR	
Pitot tube	CHECK CLEAR	
Stall warning	TEST	
Aileron	CHECK	
Freedom of movement and security		
Final		
Flight Circle	DISPATCH	
Tach, Hobbs times	RECORD	
Baggage door	LOCK	
Chocks	REMOVE	
Tie-downs	REMOVE	

Securing		
Control lock	INSTALL	
Tie-downs, chocks	APPLY	
Vents, windows	CLOSE	
Pitot cover	APPLY	
Tach, Hobbs times	RECORD	
Flight Circle	CHECK IN	
Doors	LOCK	

Speeds		
		KIAS
Best glide (V <sub>G</sub> )		65
Best angle of climb (V <sub>X</sub> )	Sea level	64
	10,000 ft	62
Best rate of climb (V <sub>Y</sub> )	Sea level	78
	10,000 ft	68
Landing approach	Flaps up	60-70
	Flaps 40	55-65
Normal takeoff climb		70-80
Short-field takeoff climb	Flaps up	59
	Flaps 10	55
Normal enroute climb	Sea level	80-90
	10,000 ft	70-80
Design maneuvering speed (V <sub>A</sub> )	2300 lbs	97
	1950 lbs	89
	1600 lbs	80

Operating Checklists

Start		
Before Start		
Preflight inspection	COMPLETE	
Passenger briefing	COMPLETE	
Brakes	TEST and SET	
Seats, belts, harnesses	SECURE	
Fuel valve	BOTH	
Radios, electrical equipment	OFF	
Circuit breakers	CHECK IN	
Beacon switch	ON	
Engine Start		
Mixture	RICH	
Carburetor heat	COLD	
Prime	AS REQUIRED	
Throttle	OPEN 1/8 INCH	
Master	ON	
Propeller area	CLEAR	
Ignition switch	START	
Release when engine starts		
Oil pressure	CHECK	
If no pressure in 30 seconds, shutdown		
Mixture	GROUND LEAN	
Before Taxi		
Avionics	ON	
Headset	ON	
Flaps	RETRACT	
Transponder	VERIFY ALT	
Weather	OBTAIN	
Altimeter	SET	
EFB Setup	AS DESIRED	
Navigation, landing lights	ON	

Run-up		
Instruments	CHECK and SET	
VOR check	IF NEEDED	
Brakes	SET	
Doors and windows	CLOSED, LOCKED	
Flight controls	FREE and CORRECT	
Fuel valve	BOTH	
Mixture	RICH (below 3000 feet)	
Throttle	1700 RPM	
Magnetos	CHECK	
Max drop 125 RPM, max diff. 50 RPM		
Engine gauges, ammeter	CHECK	
Vacuum gauge	CHECK	
Gyroscopic instruments	CHECK	
Carburetor heat	TEST	
Idle	TEST	
Mixture	GROUND LEAN	
Throttle friction	ADJUST	

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Before Takeoff		
Radios, navigation, instruments	SETUP	
Takeoff briefing	COMPLETE	
Beacon, navigation, landing lights	ON	
Carburetor heat	AS REQUIRED	
Flaps	0-10°	
Trim	TAKEOFF	
Fuel valve	BOTH	
Fuel quantity	CHECK	
Mixture	RICH (below 3000 feet)	

Climb		
Airspeed	70-90 KIAS	
Throttle	FULL	
Mixture	RICH (lean above 3000 feet)	

Cruise		
Power	2200-2700 RPM (≤75%)	
Trim	ADJUST	
Mixture	LEAN (for max RPM)	

Descent		
Mixture	RICH	
Power	AS DESIRED	
Carburetor heat	AS REQUIRED	

Before Landing		
Fuel valve	BOTH	
Mixture	RICH	
Carburetor heat	ON	
Airspeed	60-70 KIAS (flaps UP)	
Flaps	AS DESIRED	
Airspeed	55-65 KIAS (flaps DOWN)	

Balked Landing		
Throttle	FULL	
Carburetor heat	COLD	
Flaps	20°	
Airspeed	55 KIAS	
Flaps	RETRACT slowly	

After Landing		
Flaps	UP	
Caburetor heat	OFF	
Mixture	GROUND LEAN	

Shutdown		
Brakes	SET	
Tach time	RECORD	
Radios, electrical equipment	OFF	
Mixture	CUT-OFF	
Magnetos	OFF	
Master	OFF	

## Engine Failures, Forced Landings

Engine Failure During Takeoff Run	
Throttle	IDLE
Brakes	APPLY
Flaps	RETRACT
Mixture	CUT-OFF
Magnetos	OFF

Engine Failure Shortly After Takeoff	
Airspeed	Flaps up: 65 KIAS Flaps down: 60 KIAS
Mixture	CUT-OFF
Fuel valve	OFF
Magnetos	OFF
Flaps	AS REQUIRED
Master	OFF

Engine Failure During Flight	
Airspeed	65 KIAS
Carburetor heat	ON
Fuel valve	BOTH
Mixture	RICH
Magnetos	BOTH
Primer	(START if prop stopped) IN and LOCKED

Forced Landing With Engine Failure	
Airspeed	Flaps up: 65 KIAS Flaps down: 60 KIAS
Mixture	CUT-OFF
Fuel valve	OFF
Magnetos	OFF
Flaps	AS REQUIRED 40° recommended
Master	OFF
Doors	UNLATCH BEFORE TOUCHDOWN
Touchdown	SLIGHTLY TAIL LOW
Brakes	APPLY HEAVILY

Precautionary Landing	
Flaps	20°
Airspeed	60 KIAS
Selected field	FLY OVER Note terrain/obstructions. Retract flaps upon reaching a safe altitude and airspeed.
Radios, electrical switches	OFF
Flaps	40° (on final approach)
Airspeed	60 KIAS
Master	OFF
Doors	UNLATCH BEFORE TOUCHDOWN
Touchdown	SLIGHTLY TAIL LOW
Magnetos	OFF
Brakes	APPLY HEAVILY

Ditching	
Radio	MAYDAY on 121.5 MHz Give location, intentions
Heavy objects	SECURE or JETTISON
Flaps	20°-40°
Power	300 FT/MIN DESCENT AT 55 KIAS If no power available, approach flaps up 65 KIAS or flaps 10° 60 KIAS
Strong wind, heavy seas:	LAND INTO WIND
Light wind, heavy swells:	LAND PARALLEL TO SWELLS
Doors	UNLATCH
Touchdown	LEVEL ATTITUDE at established rate of descent
Face	CUSHION at touchdown with coat
Airplane	EVACUATE
Life vests/raft	INFLATE

## Fires, Icing, Flat Tire, Electrical

Engine Fire During Start On Ground	
Cranking	CONTINUE
If engine starts:	Power 1700 RPM for a few minutes
Engine	SHUTDOWN
If engine fails to start:	Throttle FULL OPEN Mixture CUT-OFF Cranking CONTINUE for 2-3 minutes
Fire extinguisher	OBTAIN
Master	OFF
Magnetos	OFF
Fuel valve	OFF
Fire	EXTINGUISH Use fire extinguisher, seat cushion, wool blanket, or dirt. If practical, try to remove air filter if it is ablaze.
Both cases: inspect and repair damage before conducting another flight.	

Engine Fire in Flight	
Mixture	CUT-OFF
Fuel valve	OFF
Master	OFF
Cabin heat & air	OFF (except overhead vents)
Airspeed	100 KIAS If fire is not extinguished, increase glide speed to find an airspeed which will provide an incombustible mixture
Forced Landing With Engine Failure checklist	EXECUTE

Electrical Fire in Flight	
Master	OFF
All other switches (except magnetos)	OFF
Vents/cabin air/heat	CLOSE
Fire extinguisher	USE
If fire appears out and electrical power is necessary to continue flight:	Master ON Circuit breakers CHECK (do not reset faulty circuit)
Radio/electrical switches	ON One at a time with delay after each until short circuit is localized
Vents/cabin air/heat	OPEN (when fire completely extinguished)

Cabin Fire	
Master	OFF
Vents/cabin air/heat	CLOSED (to avoid drafts)
Fire extinguisher	USE WARNING: After discharging extinguisher within a closed cabin, ventilate cabin
Land ASAP, inspect for damage	

Wing Fire	
Nav lights	OFF
Pitot heat	OFF
NOTE: Sideslip to keep flames away from fuel tanks and cabin. Land ASAP using flaps only as required.	

Inadvertent Icing Encounter	
Pitot heat	ON
Turn back or change altitude to obtain an OAT less conducive to icing.	
Cabin heat	FULL ON
Defroster	OPEN
Cabin air	ADJUST Maximize defroster heat and airflow
Throttle	OPEN
Carburetor/air filter icing	MONITOR Apply carb heat as required, lean mixture for maximum RPM if used continuously
Land	NEAREST AIRPORT With very rapid ice build-up, select suitable off-airport landing site
With ≥ 1/4 inch ice on the leading edges, prepare for significantly higher stall speed	
Flaps	LEAVE RETRACTED
Open left window and scrape ice from windshield, if necessary for visibility	
Forward slip if necessary for visibility	
Approach speed	65-75 KIAS Depending on level of accumulation
Landing	Perform in level attitude

Static Source Blockage	
Alternate static source valve	PULL ON
Airspeed	Use calibration table in POH section 5

Landing With a Flat Main Tire	
Approach	NORMAL
Touchdown	GOOD TIRE FIRST Hold flat tire off ground as long as possible

Over-Voltage Light Illuminates	
Master	OFF (both sides)
Master	ON
If over-voltage light illuminates again:	Flight TERMINATE ASAP

Ammeter Shows Discharge	
Alternator	OFF
Nonessential electrical equipment	OFF
Flight	TERMINATE as soon as practical