

OPERATING CHECK LIST

One of the first steps in obtaining the utmost performance, service, and flying enjoyment from your Cessna is to familiarize yourself with your airplane's equipment, systems, and controls. This can best be done by reviewing this equipment while sitting in the airplane. Those items whose function and operation are not obvious are covered in Section II.

Section I lists, in Pilot's Check List form, the steps necessary to operate your airplane efficiently and safely. It is not a check list in its true form as it is considerably longer, but it does cover briefly all of the points that you should know for a typical flight.

The flight and operational characteristics of your airplane are normal in all respects. There are no "unconventional" characteristics or operations that need to be mastered. All controls respond in the normal way within the entire range of operation. All airspeeds mentioned in Sections I and II are indicated airspeeds. Corresponding calibrated airspeed may be obtained from the Airspeed Correction Table in Section V.

BEFORE ENTERING THE AIRPLANE.

- (1) Make an exterior inspection in accordance with figure 1-1.

BEFORE STARTING THE ENGINE.

- (1) Seats and Seat Belts -- Adjust and lock.
- (2) Fuel Selector -- "BOTH ON."
- (3) Fuel Shut-Off Valve Knob -- Check safety wired to "ON" position.
- (4) Radios and Flashing Beacon -- "OFF."
- (5) Brakes -- Test and set.

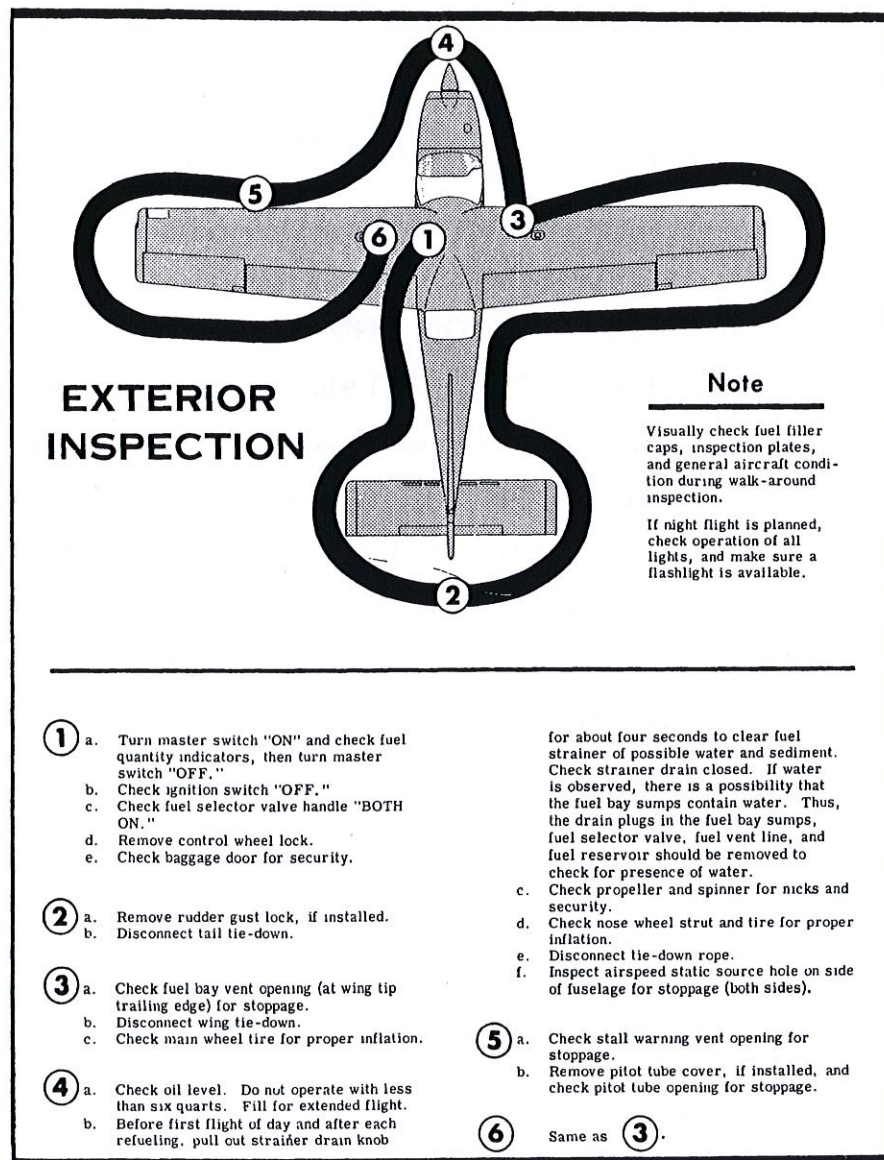


Figure 1-1.

STARTING THE ENGINE.

- (1) Mixture -- Rich.
- (2) Carburetor Heat -- Cold.
- (3) Master Switch -- "ON."
- (4) Primer -- 1 - 3 strokes (depending on temperature; none required when engine is warm). Primer locked.
- (5) Throttle -- Open 1/2".
- (6) Propeller Area -- Clear.
- (7) Ignition Switch -- "START."
- (8) Release ignition switch to "BOTH" when engine starts.
- (9) Oil Pressure -- Check.

BEFORE TAKE-OFF.

- (1) Parking Brake -- Set.
- (2) Cabin Doors -- Closed and locked.
- (3) Flight Controls -- Check.
- (4) Trim Tab -- "TAKE-OFF" setting.
- (5) Throttle Setting -- 1800 RPM.
- (6) Engine Instruments and Ammeter -- Check.
- (7) Carburetor Heat -- Check operation.
- (8) Magnetos -- Check (RPM drop should not exceed 125 RPM on either magneto or 50 RPM differential between magnetos).
- (9) Auxiliary Fuel Pump -- Check operation.

NOTE

Gravity feed will normally supply satisfactory fuel flow if the engine-driven fuel pump should fail. However, if fuel pressure drops below 2 psi, use the auxiliary fuel pump.

- (10) Suction Gage -- Check (4.6 to 5.4 inches of mercury).
- (11) Flight Instruments and Radios -- Set.
- (12) Navigation Lights and Flashing Beacon -- "ON", as required.
- (13) Optional Autopilot or Wing Leveler -- "OFF."

TAKE-OFF.

NORMAL TAKE-OFF.

- (1) Wing Flaps -- 0° to 10°.

- (2) Carburetor Heat -- Cold.
- (3) Power -- Full throttle (applied smoothly).
- (4) Airplane Attitude -- Lift nose wheel at 60 MPH.
- (5) Climb Speed -- 90 MPH.
- (6) Retract flaps (if extended).

MAXIMUM PERFORMANCE TAKE-OFF.

- (1) Wing Flaps -- 15°.
- (2) Carburetor Heat -- Cold.
- (3) Brakes -- Apply.
- (4) Power -- Full throttle.
- (5) Brakes -- Release.
- (6) Airplane Attitude -- Slightly tail low.
- (7) Climb Speed -- 65 MPH until all obstacles are cleared, then set up climb speed as shown in "MAXIMUM PERFORMANCE CLIMB" paragraph.
- (8) Wing Flaps -- Retract after obstacles are cleared.

CLIMB.

NORMAL CLIMB.

- (1) Airspeed -- 90 to 100 MPH.
- (2) Power -- Full throttle.
- (3) Mixture -- Full rich (mixture may be leaned above 5000 feet).

MAXIMUM PERFORMANCE CLIMB.

- (1) Airspeed -- 89 MPH at sea level to 85 MPH at 10,000 feet.
- (2) Power -- Full throttle.
- (3) Mixture -- Full rich (mixture may be leaned above 5000 feet).

CRUISING.

- (1) Power -- 2200 to 2700 RPM.

NOTE

Maximum cruise RPM varies with altitude. For details, refer to Section V.

- (2) Trim Tab -- Adjust.
- (3) Mixture -- Lean when power setting is 75% or less.

LET-DOWN.

- (1) Mixture -- Rich.
- (2) Power -- As desired.
- (3) Carburetor Heat -- As required to prevent carburetor icing.

BEFORE LANDING.

- (1) Fuel Selector -- "BOTH ON."
- (2) Mixture -- Rich.
- (3) Carburetor Heat -- Apply full heat before closing throttle.
- (4) Airspeed -- 80 to 90 MPH (flaps up).
- (5) Wing Flaps -- As desired (0° to 10° below 130 MPH, 10° to 30° below 105 MPH).
- (6) Airspeed -- 70 to 80 MPH (flaps down).
- (7) Trim Tab -- Adjust.

BALKED LANDING (GO-AROUND).

- (1) Power -- Full throttle.
- (2) Carburetor Heat -- Cold.
- (3) Wing Flaps -- Retract to 20° .
- (4) Upon reaching an airspeed of approximately 75 MPH, retract flaps slowly.

NORMAL LANDING.

- (1) Touchdown -- Main wheels first.
- (2) Landing Roll -- Lower nose wheel gently.
- (3) Braking -- Minimum required.

AFTER LANDING.

- (1) Wing Flaps -- Up.
- (2) Carburetor Heat -- Cold.

SECURE AIRCRAFT.

- (1) Mixture -- Idle cut-off (pulled full out).
- (2) All Switches -- Off.
- (3) Brakes -- Set.
- (4) Control Lock -- Installed.

TAXIING DIAGRAM

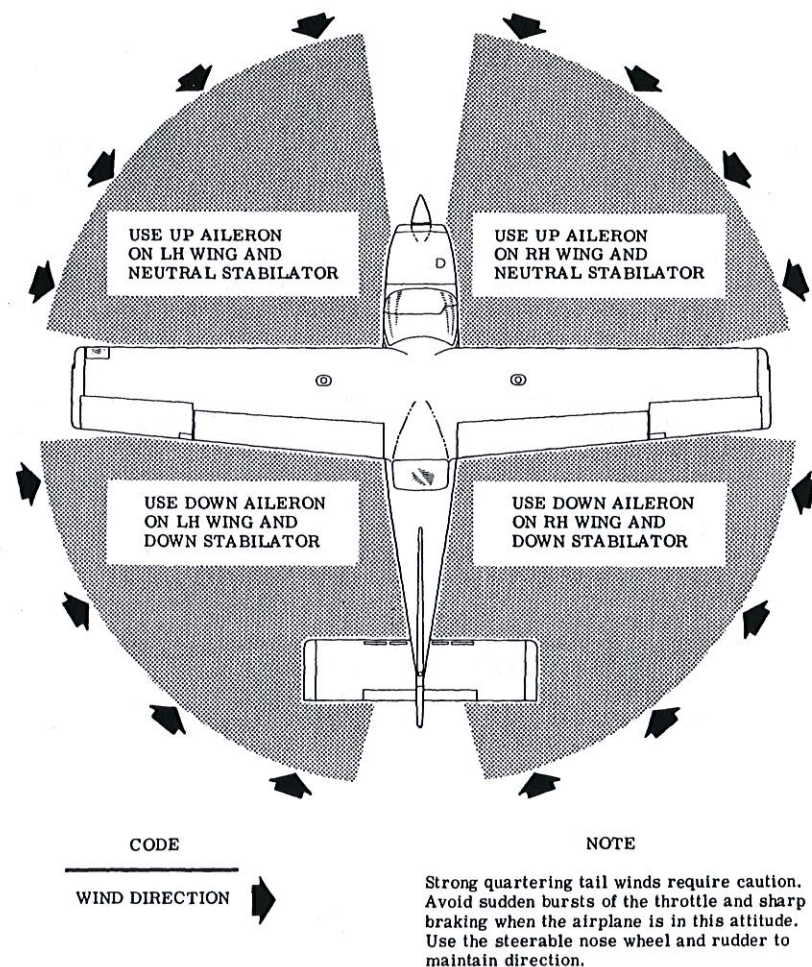


Figure 2-4.

An absence of RPM drop may be an indication of faulty grounding of one side of the ignition system or should be cause for suspicion that the magneto timing is set in advance of the setting specified.

TAKE-OFF.

POWER CHECK.

It is important to check full-throttle engine operation early in the take-off run. Any signs of rough engine operation or sluggish engine acceleration is good cause for discontinuing the take-off. If this occurs, you are justified in making a thorough full-throttle, static runup before another take-off is attempted. The engine should run smoothly and turn approximately 2360 to 2460 RPM with carburetor heat off.

Smooth and uniform throttle application should be used to insure best engine acceleration and to give long engine life. This technique is important under hot weather conditions which may cause a rich mixture that could hinder engine response if the throttle is applied too rapidly.

Full-throttle runups over loose gravel are especially harmful to propeller tips. When take-offs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be corrected immediately as described in Section IV under propeller care.

Prior to take-off from fields above 5000 feet elevation, the mixture should be leaned to give maximum RPM in a full-throttle, static runup.

WING FLAP SETTINGS.

Take-offs are accomplished with the wing flaps set in the 0° to 15° position. The preferred flap setting for normal take-off is 10°. This flap setting (in comparison to flaps up) produces a shorter ground run, easier lift-off, shorter total distance over the obstacle, and increased visibility over the nose in the initial climb-out.

For minimum ground run, a 15° flap setting should be used. This setting gives a 10% shorter ground run and approximately the same total distance as compared to the 10° flap setting.

For take-offs from high-elevation airports, especially in hot weather, a flaps-up take-off may be preferable where take-off climb would be marginal with 10° to 15° flaps.

Flap settings of greater than 15° are not recommended at any time for take-off.

PERFORMANCE CHARTS.

Consult the Take-Off Data chart in Section V for take-off distances with 15° flaps under various gross weight, altitude, headwind, temperature, and runway surface conditions.

CROSSWIND TAKE-OFFS.

Take-offs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after take-off. The airplane is accelerated to a speed slightly higher than normal, then pulled off abruptly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

CLIMB.

CLIMB DATA.

For detailed data, refer to the Maximum Rate-Of-Climb Data chart in Section V.

CLIMB SPEEDS.

Normal climbs are performed at 90 to 100 MPH with flaps up and full throttle for best engine cooling. The mixture should be full rich below 5000 feet and may be leaned above 5000 feet for smoother engine operation. The maximum rate-of-climb speeds range from 89 MPH at sea level to 85 MPH at 10,000 feet. If an obstacle dictates the use of a steep climb angle, the best angle-of-climb speed should be used with flaps up and full throttle. These speeds vary from 76 MPH at sea level to 79 MPH at 10,000 feet.

NOTE

Steep climbs at these low speeds should be of short duration to improve engine cooling.

GO-AROUND CLIMB.

In a balked landing (go-around) climb, apply full throttle smoothly, remove carburetor heat, and reduce wing flaps promptly to 20°.

Upon reaching an airspeed of approximately 75 MPH, flaps should be slowly retracted to the full up position. If obstacles are immediately ahead during the go-around, the wing flaps should be left at 20° until obstacles are cleared.

CRUISE.

Normal cruising is done between 65% and 75% power. The power settings required to obtain these powers at various altitudes and outside air temperatures can be determined by using your Cessna Power Computer or the OPERATIONAL DATA, Section V.

Cruising can be done most efficiently at high altitudes because of lower air density and, therefore, higher true airspeeds for the same power. This is illustrated in figure 2-5, which shows performance at 75% power at various altitudes.

All figures are based on lean mixture, 48 gallons of fuel (no reserve), zero wind, standard atmospheric conditions, and 2500 pounds gross weight.

OPTIMUM CRUISE PERFORMANCE			
ALTITUDE	RPM	TRUE AIRSPEED	RANGE
Sea Level	2470	128	605
5000 ft.	2600	133	630
9500 ft.	Full Throttle	138	650

Figure 2-5.

To achieve the lean mixture fuel consumption figures shown in Section V, the mixture should be leaned as follows: pull mixture control out until engine speed peaks and begins to fall off, then enrichen slightly back to peak RPM.

Carburetor ice, as evidenced by an unexplained drop in RPM, can be removed by application of full carburetor heat. Upon regaining the original RPM (with heat off), use the minimum amount of heat (by trial and error) to prevent ice from forming. Since heated air causes a richer mixture, readjust the mixture setting when carburetor heat is used continuously in cruising flight.

The use of full carburetor heat is recommended during flight in very heavy rain to avoid the possibility of engine stoppage due to excessive water ingestion. The mixture setting should be readjusted for smoothest operation.

STALLS.

The stall characteristics are conventional and aural warning is provided by a stall warning horn which sounds between 5 and 10 MPH above the stall in all configurations.

Power-off stall speeds at maximum gross weight and aft c.g. position are presented on page 5-2 as calibrated airspeeds since indicated airspeeds are unreliable near the stall.

LANDING.

Normal landings are made power-off with any flap setting. Sideslips or forward slips are permitted with any desired flap setting.

Landings should be made on the main wheels first to reduce the landing speed and subsequent need for braking in the landing roll. The nose wheel is lowered to the runway gently after the speed has diminished to avoid unnecessary nose gear loads. This procedure is especially important in rough or soft field landings.

Full down stabilator (control wheel positioned full forward) should not be used during the ground roll. This reduces the weight on the main wheels which causes poor braking and increases the possibility of sliding the tires.

SHORT FIELD LANDINGS.

For short field landings, make a power-off approach at approximately 70 MPH with full flaps, and land on the main wheels first. Immediately after touchdown, lower the nose gear to the ground and apply heavy braking as required. For maximum brake effectiveness after all three wheels are on the ground, retract the flaps and apply nose up stabilator, but do not permit the nose wheel to raise off the ground. Apply maximum possible brake pressure without sliding the tires.

CROSSWIND LANDINGS.

When landing in a strong crosswind, use the minimum flap setting required for the field length. Although the crab or combination method of drift correction may be used, the wing-low method gives the best control. After touchdown, hold a straight course with the steerable nose wheel and occasional braking if necessary.

The maximum allowable crosswind velocity is dependent upon pilot capability rather than airplane limitations. With average pilot technique, direct crosswinds of 15 knots can be handled with safety.

COLD WEATHER OPERATION.

STARTING.

Prior to starting on a cold morning, it is advisable to pull the propeller through several times by hand to "break loose" or "limber" the oil, thus conserving battery energy. In extremely cold (0°F and lower) weather, the use of an external preheater and an external power source are recommended whenever possible to obtain positive starting and to reduce wear and abuse to the engine and the electrical system. Pre-heat will thaw the oil trapped in the oil cooler, which probably will be congealed prior to starting in extremely cold temperatures. When using an external power source, the position of the master switch is important. Refer to Section VI, paragraph GROUND SERVICE PLUG RECEPTACLE, for operating details.

Cold weather starting procedures are as follows:

With Preheat:

- (1) With ignition switch "OFF" and throttle closed, prime the engine four to eight strokes as the propeller is being turned over by hand.

AIRSPEED CORRECTION TABLE

FLAPS UP	60	70	80	90	100	110	120	130	140	150
IAS-MPH	64	74	84	93	103	112	121	130	139	148
CAS-MPH	64	73	83	92	101	111	120	130	—	—
FLAPS 10°	60	70	80	90	100	110	120	130	—	—
IAS-MPH	64	73	83	92	101	111	120	130	—	—
CAS-MPH	64	73	83	92	101	111	120	130	—	—
FLAPS 30°	50	60	70	80	90	100	105	—	—	—
IAS-MPH	54	64	74	83	92	100	104	—	—	—
CAS-MPH	54	64	74	83	92	100	104	—	—	—

Figure 5-1.

POWER OFF STALLING SPEEDS MPH - CAS

GROSS WEIGHT 2500 LBS	ANGLE OF BANK	0°	20°	40°	60°
FLAPS UP	0°	66	68	75	93
FLAPS 10°	0°	60	62	69	85
FLAPS 30°	0°	56	58	63	79

Figure 5-2.

TAKE-OFF DATA

TAKE-OFF DISTANCE FROM HARD SURFACE RUNWAY WITH FLAPS 15°

GROSS WEIGHT POUNDS	IAS AT 50' MPH	HEAD WIND KNOTS	AT SEA LEVEL & 59°F		AT 2500 FT. & 50°F		AT 5000 FT. & 41°F		AT 7500 FT. & 32°F	
			GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS
2500	65	0	845	1575	1005	1850	1210	2255	1470	2845
		10	580	1185	705	1405	860	1735	1060	2215
		20	365	840	450	1010	565	1270	710	1650
2200	61	0	630	1220	750	1410	900	1670	1085	2015
		10	425	900	510	1050	620	1255	765	1540
		20	255	620	315	735	390	895	495	1110
1900	57	0	455	945	540	1070	640	1240	770	1455
		10	295	685	355	785	430	915	525	1085
		20	165	460	205	535	260	630	325	760

- NOTES: 1. Increase distance 10% for each 20°F above standard temperature for particular altitude.
2. For operation on a dry, grass runway, increase distances (both "ground run" and "total to clear 50 ft. obstacle") by 7% of the "total to clear 50 ft. obstacle" figure.

MAXIMUM RATE-OF-CLIMB DATA

GROSS WEIGHT POUNDS	AT SEA LEVEL & 59°F			AT 5000 FT & 41°F			AT 10,000 FT & 23°F			AT 15,000 FT & 5°F		
	IAS MPH	RATE OF CLIMB FT/MIN	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN	FROM S.L. FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN	FROM S.L. FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN	FROM S.L. FUEL USED
2500	89	760	1.5	87	550	3.3	85	340	5.2	83	135	8.6
2200	87	925	1.5	85	720	2.9	83	510	4.2	81	305	6.0
1900	85	1130	1.5	83	920	2.6	81	715	3.6	79	510	4.8

- NOTES: 1. Flaps up, full throttle and mixture leaned for smooth operation above 5000 ft.
2. Fuel used includes warm up and take-off allowance.
3. For hot weather, decrease rate of climb 20 ft./min. for each 10°F above standard day temperature for particular altitude.

Figure 5-3.