

Section **II**

operating check list

AFTER FAMILIARIZING YOURSELF with the equipment of your airplane, your primary concern will normally be its operation. This section lists in check list form the steps necessary to operate your airplane efficiently and safely. All airspeeds mentioned in Sections II and III are indicated airspeeds. Corresponding true indicated airspeeds may be obtained from the airspeed correction table in Section VI.

The ground and flight handling characteristics of the airplane are normal in all respects. All control movements, and response, are conventional throughout the entire operational range.

BEFORE ENTERING AIRPLANE.

- (1) Perform an exterior inspection of the airplane (see figure 2-1).

BEFORE STARTING THE ENGINE.

- (1) Adjust seat to a comfortable position, check to see that seat locking mechanism is secure, and fasten safety belt.
- (2) Check all flight controls for free and correct movement.
- (3) Check wing flaps at all positions.
- (4) Push cowl flaps control to full "Open" position.
- (5) Turn fuel selector valve to "Both". (Take-off on less than $\frac{1}{4}$ tank is not recommended).
- (6) Rotate adjustable stabilizer control wheel so that indicator is in "Take-Off" range.
- (7) Rotate rudder trim control wheel approximately two turns clockwise from neutral for climb power setting (if desired).
- (8) Set altimeter and clock.
- (9) Test operate brakes and set parking brake.
- (10) Check radio switches "Off".
- (11) For night flight, test operate all exterior and interior lights. As a precaution, a flashlight should be on board in a usable condition.

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STARTING ENGINE.

- (1) Set mixture control to "Full Rich" (full in).
- (2) Set carburetor heat to "Cold" (full in).
- (3) Set propeller control for "high RPM" (full in).
- (4) For an initial start in normal air temperatures, use one or two strokes of the primer.
- (5) Turn master switch "On".
- (6) Open throttle approximately $\frac{1}{2}$ inch.
- (7) Turn ignition switch to "Both".
- (8) Clear the propeller.
- (9) Push starter button until engine fires (but no longer than 30 seconds).

NOTE

If engine has been overprimed, start engine with throttle position $\frac{1}{4}$ to $\frac{1}{2}$ full open. Be sure to reduce throttle to idle position when engine fires.

WARM-UP AND GROUND TEST.

- (1) Do not allow the engine to operate at more than 800 RPM for the first 60 seconds after starting. (Avoid prolonged idling below 800 RPM at all times).
- (2) Check for oil pressure indications within 30 seconds in warm temperatures or 60 seconds in cold weather. *If no indication occurs, shut engine down and investigate the cause.*
- (3) Avoid the use of carburetor heat unless icing conditions prevail.
- (4) Continue the warm-up while taxiing out to the active runway, using care not to over-heat the engine by running at unnecessarily high RPM's on the ground.

NOTE

To avoid propeller tip abrasion, do not run up engine on loose cinders or gravel.

- (5) Check the RPM drop on each magneto at 1700 RPM. The maximum allowable drop is 125 RPM.
- (6) Check carburetor heat by noticing RPM drop when heat is applied.
- (7) a. Hartzell Propeller — Check propeller operation in high and low pitch at 1700 RPM. Return control to low pitch (full in) and reduce power.
b. McCauley Propeller — At 1700 RPM move propeller control out until a slight drop in RPM is noticed. Then return propeller to low

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pitch (full in) position. This drop in RPM shows that governor operation is satisfactory.

- (8) If engine accelerates smoothly and oil pressure remains steady at some value between 30 and 60 psi, the engine is warm enough for take-off.

BEFORE TAKE-OFF.

- (1) Recheck free and correct movement of flight controls.
- (2) Recheck adjustable stabilizer control wheel setting.
- (3) Recheck rudder trim control wheel setting.
- (4) Recheck cowl flaps "Open".
- (5) Check carburetor heat control "Off" (full in) unless extreme icing conditions prevail.
- (6) Recheck propeller in low pitch (full in).
- (7) Check autopilot disengaged (if installed).

TAKE-OFF.

NORMAL TAKE-OFF.

- (1) Apply full throttle smoothly to avoid propeller surging.
- (2) Avoid dragging brake by keeping heels on the floor.
- (3) Raise nosewheel at 60 MPH and airplane will break ground at approximately 70 MPH.

CAUTION

Do not raise the nose of the airplane excessively high as this will only lengthen the take-off run.

- (4) Level off momentarily and accelerate to 100 MPH.

MINIMUM RUN TAKE-OFF.

- (1) Wing flaps 20° (second notch).
- (2) Hold brakes while applying full throttle.
- (3) Release brake and keep heels on floor to avoid dragging brakes.
- (4) Take-off slightly tail low.

OBSTACLE CLEARANCE TAKE-OFF.

- (1) Wing flaps 20° (second notch).
- (2) Hold brakes while applying full throttle.
- (3) Release brakes and take-off slightly tail low.
- (4) Climb out at best angle of climb speed (60 MPH).

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SOFT OR ROUGH FIELD TAKE-OFF WITH NO OBSTACLES.

- (1) Wing flaps 20° (second notch).
- (2) Apply full throttle and raise nose wheel clear of the ground with elevator control back pressure.
- (3) Take-off in this attitude and level off momentarily to accelerate to a safe airspeed.
- (4) Retract flaps slowly as soon as a safe altitude is obtained. (See "Take-Off" paragraph on page 3-4).

TAKE-OFF IN STRONG CROSS WIND.

- (1) Flaps 0° (retracted).
- (2) Apply full throttle and use sufficient aileron into the wind to maintain wings level.
- (3) Hold nose wheel on ground 5-10 MPH above normal take-off speed.
- (4) Take-off abruptly to prevent airplane from settling back to the runway while drifting.

CLIMB.

- (1) If no obstacle is ahead, climb out with flaps up at 100-120 MPH with 23 inches manifold pressure and 2450 RPM.
- (2) If maximum climb performance is desired, use full throttle, 2600 RPM, and 90 MPH, IAS at sea level (see figure 6-2). Reduce climb speed about ½ MPH for every 1000 feet of altitude above sea level.
- (3) To climb over an obstacle after take-off, the best angle of climb speed (70 MPH, IAS) should be used.
- (4) Cowl flaps should be "Open" for climbs in normal air temperature.
- (5) Mixture should be full rich unless engine becomes rough due to rich mixture.

CRUISING.

- (1) Close cowl flaps.
- (2) Select cruising power setting from range charts (figure 6-3) for desired range and speed.
- (3) Maximum recommended power setting for cruise is 23 inches manifold pressure and 2450 RPM.
- (4) After speed has stabilized, trim airplane with adjustable stabilizer control wheel and rudder trim control wheel.
- (5) Lean mixture as follows: pull mixture control out until engine becomes rough; then, enrichen mixture slightly beyond this point. Any change in altitude, power, or carburetor heat will require a change in lean

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mixture setting. Do not lean mixture with power setting above 23 inches of manifold pressure and 2450 RPM.

- (6) Check engine instruments for indications within their normal operating range (green arcs).

LET-DOWN

- (1) Set mixture control "Full Rich" (full in).
- (2) Reduce power to obtain let-down rate at cruising speed.
- (3) Apply sufficient carburetor heat to prevent icing, if icing conditions exist.
- (4) Check autopilot disengaged before entering traffic pattern.

BEFORE LANDING.

- (1) Set fuel selector valve to "Both".
- (2) Recheck mixture "Full Rich" (full in).
- (3) Set the propeller control for at least 2450 RPM so that high power will be available in the event of a go around.
- (4) Check cowl flaps closed.
- (5) Apply carburetor heat before closing throttle.
- (6) Glide at 80-90 MPH with flaps up.
- (7) Lower flaps as desired below 100 MPH.
- (8) Maintain 70-80 MPH with flaps extended.
- (9) Trim airplane with adjustable stabilizer for glide.

LANDING.

NORMAL LANDING.

- (1) Flare out the approach several feet above the ground.
- (2) Endeavor to contact the ground in a slightly nose high attitude, just sufficient to prevent hitting the nose wheel first.
- (3) Lower the nose wheel down gently after speed is diminished.

SHORT FIELD LANDING.

- (1) Make a power-off approach at 70 MPH with flaps down 40°.
- (2) Flare-out several feet above the ground so that the main wheels will contact first.
- (3) Lower nose wheel to the ground immediately after touch-down.
- (4) Apply heavy braking as required.

CAUTION

Excessive braking will skid tires, resulting in lengthened

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ground run and tire damage.

LANDING IN STRONG CROSS WIND.

- (1) It is preferable, if field length permits, to land with flaps retracted.
- (2) Use wing low, crab, or combination method of drift correction.
- (3) Land in a nearly level attitude.
- (4) Hold straight course with steerable nose wheel and occasional braking if necessary.

AFTER LANDING.

- (1) Open cowl flaps.
- (2) Raise wing flaps after completion of landing roll.
- (3) Carburetor heat "Off".
- (4) Stop engine by pulling out mixture control knob to "Full Lean."
Do not open throttle as engine stops since this actuates the accelerator pump.
- (5) After engine stops, turn ignition switch "Off."
- (6) Turn master switch "Off." *Be Sure* — otherwise the battery may run down overnight.
- (7) Set parking brakes, if required.

NOTE

A prolonged sideslip in the direction of the fuel tank in use or a prolonged steep descent can cause engine fuel starvation if the fuel quantity is low, since the fuel tank outlet may become uncovered in these attitudes.

The quickest recovery of fuel flow to the engine can be accomplished in the following manner:

- (1) Level the aircraft.
- (2) Place fuel selector valve on "BOTH."
- (3) Push mixture control to Full Rich.
- (4) Push throttle full forward.
- (5) Apply full carburetor heat.

Engine operation should resume within 15 seconds if this procedure is executed promptly.

Section VI

operational data

THE OPERATIONAL DATA shown on the following pages are compiled from actual tests with airplane and engine in good condition and using average piloting technique and lean mixture. You will find this data a valuable aid when planning your flights. However, inasmuch as the number of variables involved precludes great accuracy, an ample fuel reserve should be provided. The charts make no allowance for wind, navigational error, pilot technique, warm-up, take-off, climb, etc. All of these factors must be considered when estimating reserve fuel.

In addition to the advantages of comfort and safety, airplanes are primarily an exceptionally rapid mode of transportation. Therefore, to realize the maximum usefulness from your Cessna, take advantage of the power your engine can develop. For normal cruising, choose a cruising power setting which gives you a fast cruising speed. If your destination is over 600 miles, it may pay you to fly at lower power settings, thereby increasing your range and allowing you to make the trip non-stop with ample fuel reserve. Use the range charts to solve flight planning problems of this nature.

Airspeed Correction Table								
FLAPS UP	IAS	60	80	100	120	140	160	180
	TIAS	68	82	100	118	138	157	176
FLAPS DOWN	IAS	40	50	60	70	80	90	100
	TIAS	56	60	67	74	83	92	101

Figure 6-1. Airspeed Correction Table

TAKE - OFF DATA

TAKE-OFF DISTANCE WITH 20° FLAPS FROM HARD SURFACE RUNWAY.

GROSS WEIGHT LBS.	HEAD WIND MPH	AT SEA LEVEL & 59° F.		AT 2500 FT. & 50° F.		AT 5000 FT. & 41° F.		AT 7500 FT. & 32° F.	
		GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE
2100	0	335	715	390	810	465	935	560	1100
	15	185	465	225	540	270	625	330	745
	30	75	260	95	305	125	365	160	450
2400	0	440	895	525	1040	630	1210	770	1465
	15	255	600	310	700	380	835	475	1020
	30	115	350	150	420	190	510	245	640
2650	0	555	1080	665	1260	790	1500	965	1835
	15	330	735	405	865	490	1050	655	1345
	30	160	445	205	535	255	665	335	845

Note: Increase distances 10% for each 25°F above standard temperature for particular altitude.

CLIMB DATA

GROSS WEIGHT LBS.	AT SEA LEVEL & 59° F.			AT 5000 FT. & 41° F.			AT 10000 FT. & 23° F.			AT 15000 FT. & 5° F.			AT 20000 FT. & -12° F.		
	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	GAL. OF FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	From SL FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	From SL FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	From SL FUEL USED	BEST CLIMB IAS MPH	RATE OF CLIMB FT/MIN	From SL FUEL USED
2100	87	1470	1.5	82	1200	2.8	78	925	4.3	73	655	6.2	68	385	9.0
2400	88	1210	1.5	84	960	3.1	80	710	5.0	76	460	7.6	71	210	12.0
2650	90	1030	1.5	86	795	3.5	83	560	5.9	78	325	9.3	74	90	17.1

Note: Flaps up, full throttle and 2600 RPM. Mixture leaned for smooth operation above 5000 ft. Fuel used includes warm-up and take-off allowance.

Figure 6-2. Take-Off and Climb Chart

OPERATIONAL DATA

SKYLANE CRUISE AND RANGE
PERFORMANCE

Altitude	RPM	M. P.	BHP	%BHP	TAS MPH	Gal./Hr.	End. Hours	Mi./Gal.	Range Miles
2500	2450	23	175	76	158	14.2	3.9	11.2	615
		22	166	72	154	13.4	4.1	11.5	635
		21	157	68	151	12.7	4.3	11.9	655
		20	148	63	148	12.0	4.6	12.2	670
	2300	23	164	71	154	13.1	4.2	11.7	645
		22	153	67	149	12.2	4.5	12.3	680
		21	143	62	145	11.5	4.8	12.7	695
		20	135	59	142	11.0	5.0	12.9	710
	2200	23	153	67	149	12.1	4.6	12.4	680
		22	144	63	146	11.4	4.8	12.8	700
		21	135	59	142	10.8	5.1	13.2	725
		20	126	55	138	10.2	5.4	13.5	740
Maximum Range Settings	2000	20	107	47	126	8.7	6.3	14.4	795
		19	99	43	121	8.2	6.7	14.8	810
		18	89	39	113	7.5	7.3	15.0	825
		17	81	35	105	7.0	7.9	15.1	830
5000	2450	23	179	78	163	14.5	3.8	11.2	615
		22	169	73	159	13.6	4.0	11.7	640
		21	161	70	156	13.0	4.2	12.0	660
		20	150	65	151	12.2	4.5	12.5	685
	2300	23	167	73	158	13.4	4.1	11.8	650
		22	158	69	155	12.6	4.4	12.2	675
		21	148	64	151	11.9	4.6	12.7	700
		20	139	60	146	11.2	4.9	13.1	720
	2200	23	157	68	155	12.4	4.4	12.5	685
		22	148	64	151	11.7	4.7	12.9	710
		21	138	60	146	11.0	5.0	13.3	730
		20	131	57	143	10.5	5.2	13.6	750
Maximum Range Settings	2000	19	103	45	126	8.5	6.5	14.9	820
		18	94	41	118	7.9	7.0	15.1	830
		17	86	37	111	7.3	7.5	15.2	835
		16	79	34	103	6.8	8.0	15.1	830
7500	2450	21	163	71	161	13.1	4.2	12.2	670
		20	153	67	157	12.4	4.4	12.7	700
		19	143	62	152	11.7	4.7	13.0	715
		18	133	58	147	11.0	5.0	13.4	735
	2300	21	151	66	156	12.2	4.5	12.7	700
		20	142	62	151	11.6	4.7	13.0	715
		19	133	58	147	11.0	5.0	13.3	735
		18	125	54	142	10.5	5.2	13.5	745
	2200	21	143	62	152	11.4	4.8	13.4	735
		20	134	58	148	10.7	5.1	13.8	760
		19	126	54	143	10.2	5.4	14.0	770
		18	118	51	138	9.7	5.7	14.3	790
Maximum Range Settings	2000	19	107	47	131	8.7	6.3	15.0	825
		18	98	43	123	8.1	6.8	15.2	835
		17	90	39	116	7.6	7.2	15.3	840
		16	82	36	107	7.0	7.8	15.3	840

Cruise performance shown is based on standard conditions, zero wind, lean mixture, 55 gallons of fuel, no fuel reserve, and 2650 pounds gross weight. For 182 performance, subtract approximately 3 miles per hour from the maximum cruise speeds shown.

Figure 6-3. Range Chart (Sheet 1)

OPERATIONAL DATA

SKYLANE CRUISE AND RANGE PERFORMANCE									
Altitude	RPM	M. P.	BHP	%BHP	TAS MPH	Gal/Hr.	End. Hours	Mi/Gal.	Range Miles
10,000	2450	19	146	63	156	11.9	4.6	13.1	735
		18	137	60	152	11.2	4.9	13.5	745
		17	127	55	146	10.6	5.2	13.8	755
		16	118	51	141	10.0	5.5	14.0	770
	2300	19	137	60	152	11.1	5.0	13.7	750
		18	128	56	147	10.5	5.2	14.0	770
		17	118	51	141	9.8	5.6	14.3	790
		16	109	47	134	9.2	6.0	14.5	795
	2200	19	129	56	148	10.4	5.3	14.2	780
		18	120	52	142	9.8	5.6	14.6	800
		17	112	49	136	9.3	5.9	14.7	805
		16	103	45	129	8.7	6.3	14.9	815
Maximum Range Settings	2000	18	102	44	128	8.4	6.5	15.2	835
		17	93	40	120	7.8	7.1	15.4	845
		16	87	38	114	7.4	7.4	15.4	845
		15	80	35	105	6.9	8.0	15.2	835
15,000	2450	16	124	54	150	10.4	5.3	14.4	790
		15	114	50	142	9.8	5.6	14.6	805
		14	105	46	135	9.2	6.0	14.7	810
	2300	16	115	50	143	9.6	5.7	14.8	815
		15	107	47	136	9.1	6.0	15.0	825
		14	98	42	127	8.5	6.5	15.0	825
	2200	16	109	47	138	9.1	6.0	15.2	835
		15	101	44	130	8.6	6.4	15.2	835
		14	92	40	120	8.0	6.9	15.1	830
	Maximum Range Settings	16	93	40	122	7.8	7.1	15.7	865
		15	86	37	112	7.3	7.5	15.3	855
		14	78	34	101	6.8	8.1	14.9	820
20,000	2450	13	102	44	133	9.0	6.1	14.9	820
		12	93	40	122	8.3	6.6	14.6	805
	2300	13	96	42	126	8.4	6.6	15.1	830
		12	87	38	113	7.7	7.1	14.6	805
	2200	13	90	39	118	7.8	7.0	15.1	830
		12	81	35	103	7.2	7.7	14.4	790
	Cruise performance shown is based on standard conditions, zero wind, lean mixture, 55 gallons of fuel, no fuel reserve, and 2650 pounds gross weight. For 182 performance, subtract approximately 3 miles per hour from the maximum cruise speeds shown.								

Figure 6-3. Range Chart (Sheet 2)

OPERATIONAL DATA

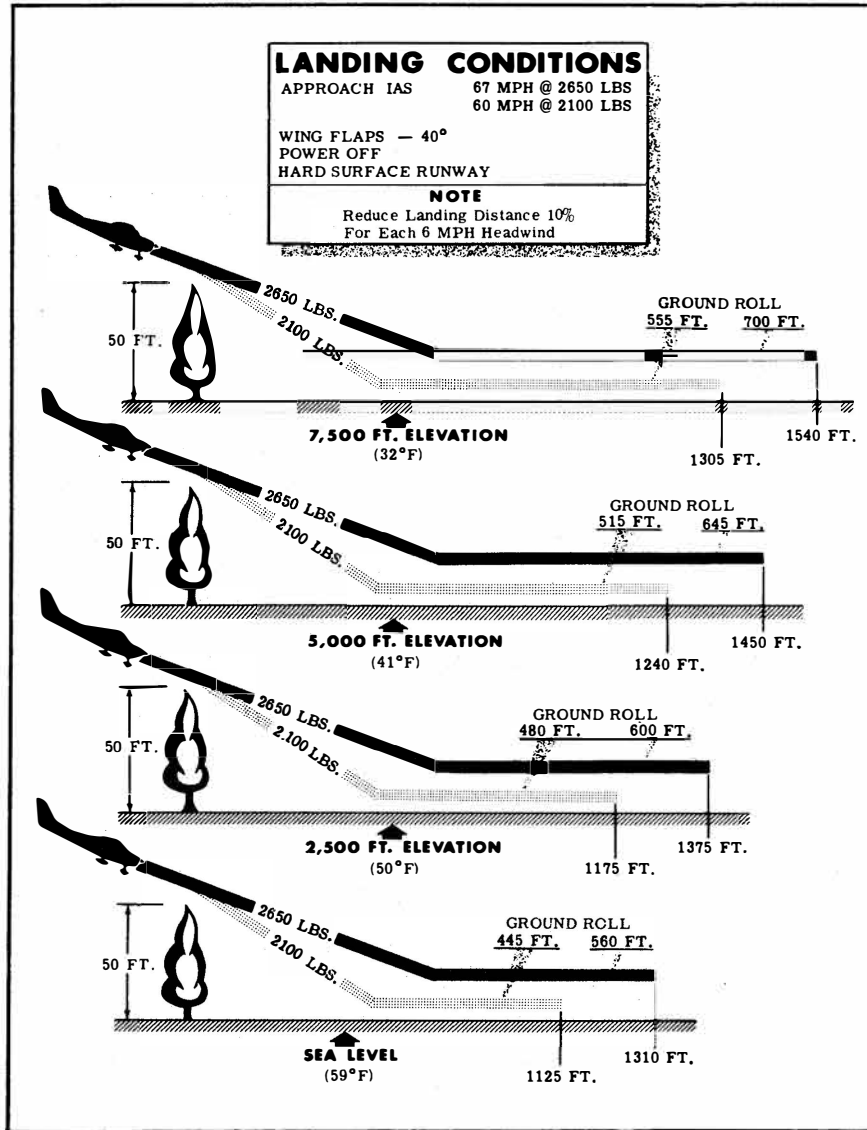


Figure 6-4. Landing Diagram