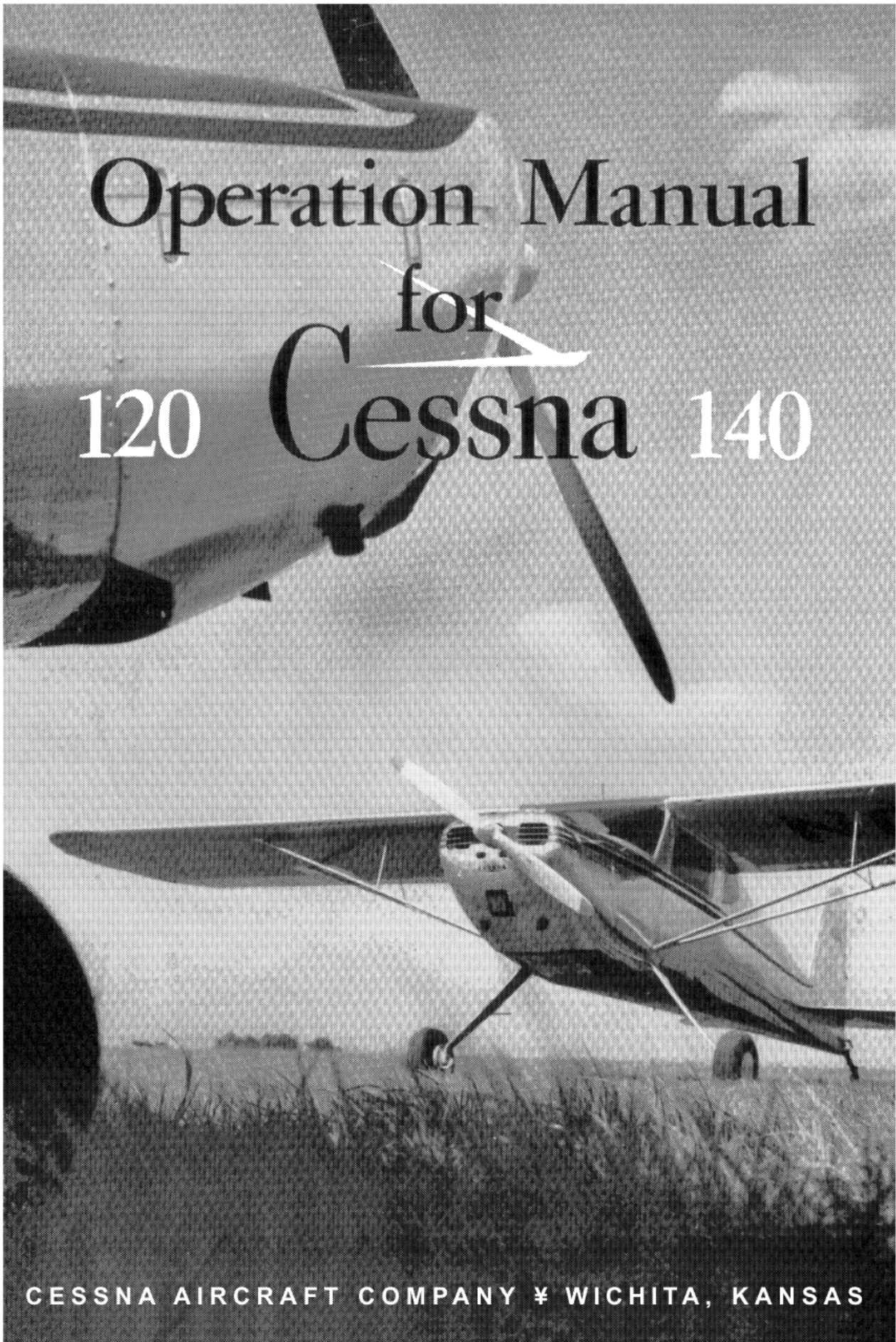


Operation Manual Excerpts, Cessna 140

NTSB Investigation: ERA23FA233



Operation Manual for 120 Cessna 140

CESSNA AIRCRAFT COMPANY • WICHITA, KANSAS

OPERATING CHECK LIST

- (5) Check engine magnetos at 1800 r.p.m. by opening the throttle and switching off separately each magneto momentarily. Drop of r.p.m. from 1800 r.p.m. should not exceed 50 r.p.m. on the right magneto or 75 r.p.m. on the left magneto. Switch to both magnetos before continuing.
- (6) Full throttle r.p.m. check is optional. Engine should run smoothly and turn, with carburetor heat off, 1900 r.p.m. or more with wood prop, and 2100 r.p.m. or more with metal prop. Engine should idle between 500 and 550 r.p.m.

F. TAKE-OFF

- (1) Release brake.
- (2) For take-off use full throttle.
- (3) Turn carburetor heat "off."
- (4) Heels on the floor.
- (5) Climb at full throttle. Best rate of climb airspeed 73 m.p.h. indicated. The engine will turn 2250 to 2380 r.p.m.

G. CRUISING

- (1) Cruising r.p.m. 2400. (Do not exceed 2575 r.p.m.)
- (2) Trim airplane by adjusting elevator tab.
- (3) Oil pressure — 30-40 lbs. sq. in.
- (4) Oil temperature — maximum 220°F.
- (5) Above 5000 ft. lean mixture as required to obtain maximum r.p.m. (If mixture control installed.)

H. BEFORE LANDING

- (1) Set fuel valve to fullest tank.
- (2) Set mixture control full rich (if installed).
- (3) Apply full carburetor heat before closing throttle.
- (4) Suggested glide speed 65-70 m.p.h.
- (5) Use tab to relieve control wheel pressure when establishing glide.
- (6) Lower flaps as desired (do not lower flaps when indicated airspeed is above 82 m.p.h.)

OPERATION AND PERFORMANCE DATA

AIRSPPEED LIMITATIONS:

The following are the certificated airspeed limits:

	LANDPLANE	SEAPLANE
Glide or Dive (smooth air)	140 m.p.h. (red line)	140 m.p.h. (red line)
Level Flight or Climb (normal range marked with green arc, caution range marked with yellow arc, 115 to 140 m.p.h.)	115 m.p.h.	105 m.p.h.
Flap Extension and Operation (flap operating range marked by a white arc)	82 m.p.h.	82 m.p.h.

All airspeeds are true indicated

The airplane is not designed for purely acrobatic flight. However, in the acquisition of various certificates by the pilot owner such as private pilot, commercial pilot, instrument pilot and flight instructor, certain maneuvers are required by the CAA. All of these maneuvers are permitted in the Cessna 140 and 120.

In connection with the above the following maneuvers may be performed:

	Recommended Entry Speed
(1) Steep Turns	90
(2) Spins	Use power to enter
(3) Stalls (except whip-stalls)	—
(4) Lazy Eights	100
(5) Chandelles	100

Spins with flaps down are prohibited due to the fact that recovery cannot be made without exceeding flap design speeds. Acrobatics that may impose high inverted loads should not be attempted. The important thing to bear in mind in flight maneuvers is that the Cessna 140 and 120 Models are exceptionally

OPERATION AND PERFORMANCE DATA

OPERATIONAL DATA:

PERFORMANCE INFORMATION

The following operational data are compiled from actual tests with airplane and engine in good condition and using average piloting technique. Data are based upon a gross weight of 1450 lbs. with standard Sensenich 74FK-49 propeller installed, and apply to both 120 and 140 models. Performance figures are for zero wind velocity and hard surface level runway. Speeds are true indicated airspeeds.

Airspeed	Indicated	40	60	80	100	120	140
Calibration	True Indicated	46	65	83	100	116	133

ITEM	ALTITUDE	OUTSIDE AIR TEMPERATURE					
		0°F	20°F	40°F	60°F	80°F	100°F
<i>Take Off Distance</i>	Sea Level	465	530	594	663	728	795
(Ground Run in Feet)	2000 Ft.	600	689	761	842	923	1004
Airspeed 50 MPH Takeoff	4000 Ft.	760	857	956	1054	1152	1250
Full Throttle, Flaps Up	6000 Ft.	980	1101	1222	1343	1464	1585

Take Off Correction: Reduce above distances 10% for each 5 MPH Wind Velocity.

<i>Landing Distance</i>	Sea Level	233	266	299	332	365	398
(Ground Run in Feet)	2000 Ft.	274	321	348	385	422	460
Approach at 70 MPH	4000 Ft.	329	372	414	457	500	542
Flaps Up	6000 Ft.	381	428	475	522	569	616

<i>Landing Distance</i>	Sea Level	212	242	272	302	332	362
(Ground Run in Feet)	2000 Ft.	252	286	320	354	388	422
Approach at 70 MPH	4000 Ft.	302	341	380	419	458	497
Flaps Down	6000 Ft.	352	396	439	483	527	570

Landing Correction: Reduce above distances 10% for each 5 MPH Wind Velocity.

<i>Normal Rate Climb</i>	81	Sea Level	740	710	675	640	605	570
(Feet Per Minute)	79	2000 Ft.	660	625	595	560	530	495
Flaps Up	76	4000 Ft.	555	520	490	460	425	395
Full Throttle	74	6000 Ft.	455	425	395	365	330	300

Stalling Speed M.P.H. T.I.A.S.	Condition	Angle of Bank Degrees			
		0°	20°	40°	60°
	Power Off; Flaps Up	49	50	56	69
	Power Off; Flaps Down	45	46	52	65
	Power On; Flaps Up	40	41	46	57
	Power On; Flaps Down	37	38	43	52

OPERATING DETAILS

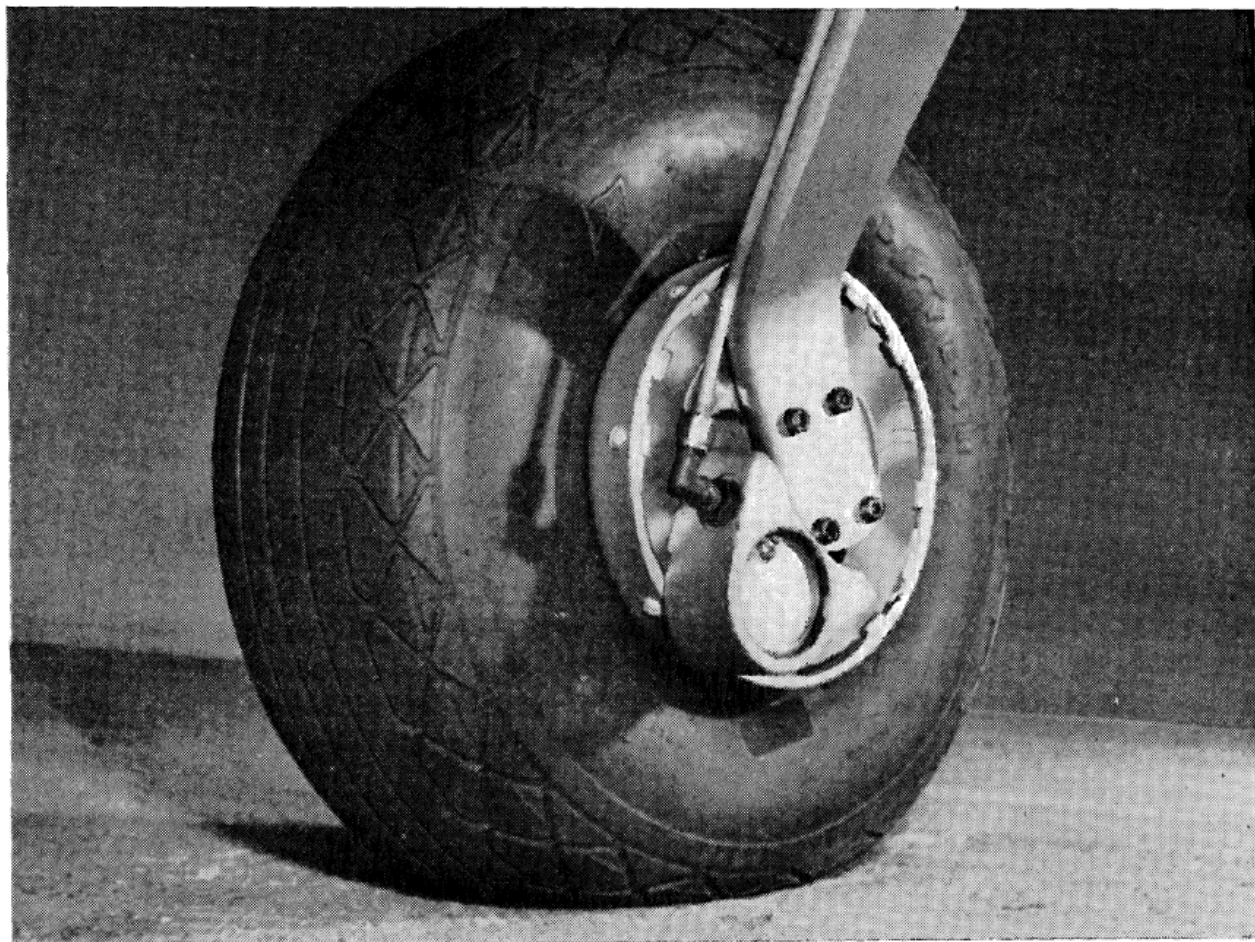
of the seat between the pilot and passenger. The tab indicator adjacent to the wheel shows the relative position of the tab. Forward movement of the wheel trims nose down and vice versa. This allows the airplane to be trimmed to fly level for a wide selection of load and speed conditions.

FLAPS:

Flaps installed only on the 140 are raised or lowered with the flap handle located between the pilot and the passenger. Flaps may be lowered or raised during normal flying whenever the airspeed is less than 82 m.p.h. Intentional spinning with "flaps down" is prohibited. The flaps supply some added lift and considerable drag; the resulting action steepens the glide of the airplane enabling the pilot to bring the airplane in over an obstruction and land shorter than could be done without flaps. Forward speed of the airplane is only slightly affected by the action of the flaps.

For unusually short field take-offs the application of full flaps

Figure 9 — Wheel and Brake Installation



THIS DOCUMENT MUST BE KEPT IN AIRPLANE AT ALL TIMES

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS

C.A.A. Identification

NC _____

C.A.A. Approved
Approval Basis CAR 04a
January 2, 1948

MODEL 120 & 140 LANDPLANE (C-85)

AIRPLANE FLIGHT MANUAL

1. Limitations

The following limitations are to be observed in the operation of this airplane equipped with Continental C85-12 or C85-12F engine.

Engine Limits - For all operations 2575 R.P.M. (85 H.P.)

Fuel - 73 Minimum Octane Aviation Gasoline

(Capacity two tanks 12 1/2 gallons each -- 25 total)

- Propeller - (a) Wood Fixed Pitch-Static R.P.M. at maximum permissible throttle setting -- not more than 2110 R.P.M., not less than 1885 R.P.M. (Diameter - not over 74 inches, not less than 72.5 inches)
- (b) McCauley 1A90 Static R.P.M. at maximum permissible throttle setting -- not more than 2300, not less than 2100. (Diameter not more than 71 inches, not less than 69.5 inches.)
- (c) Avoid continuous operation between 1950 and 2170.
- (c) For other approved installations see Aircraft Specification A-768.

Power Plant Instrument -

(a) Oil Temperature - unsafe above 225°F (Red Line)

(b) Tachometer - Do not exceed rated engine speed 2575 R.P.M. (Red Line)

(c) Fuel quantity gauge - Do not take off on a fuel tank less than 1/4 full.

Airspeed Limits -

(True Indicated Airspeed) -

Never Exceed	140 MPH (Red Line)
Caution Range	115 to 140 MPH (Yellow Arc)
Normal Operation	50 to 115 MPH (Green Arc)
Flap Operating Range	45 to 82 MPH (White Arc)

Flight Load Factors -

High or low angle of attack ± 4.57 ; Inverted Flight - 2.26

Flaps down $40^\circ \pm 1.97$.

Maximum Weight - 1450 Lbs.

C.G. Range - (+13.5) 22% M.A.C. to (+17.7) 29.2% M.A.C.

Datum Leading Edge of Wing

M.A.C. 59 inches, L.E. M.A.C. ± 0.5

Leveling Means - Top Edge of sheet along fuselage side aft of door.

Limitations Notes -

1. Intentional Spins with flaps extended are prohibited.
2. No acrobatic maneuvers approved except those listed. Recommended entry speeds shown.
Chandelle 100; Steep Turn 90; Stalls, (Except Whip Stalls); Lazy Eight 100; Spins, use power to enter.
3. In the execution of all maneuvers avoid the abrupt use of controls.
4. It is the responsibility of the pilot and operator to see that the weight and balance are within limitations.

2. Procedures:

Apply carburetor heat when gliding at less than half throttle specifically when making a landing.

Date: *March 26, 1948*

Approved By: *Charles F. Jones*

Director,
Aircraft & Components Service