(4) Lazy Eights	110
(5) Chandelles	110

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 170 is clean in aerodynamic design and will build up speed quickly with the nose down. Proper speed control is an essential requirement for execution of any maneuver and care should always be exercised to avoid excessive speed which in turn can impose excessive loads. In the execution of all maneuvers avoid abrupt use of controls.

Limit loads – Normal category * Gross weight 2200 pounds

Flaps up	+3.8	−1.52
Flaps down	+3.8	−1.52

Limit loads – Utility category * Gross weight 1900 pounds

Flaps up	+4.4	−1.76
Flaps down	+4.4	−1.76

AIRSPEED LIMITATIONS:

The following are the certificated airspeed limits:

	LANDPLANE
Glide or Dive (smooth air)	160 m.p.h. *(red line)*
Level Flight or Climb	140 m.p.h. (normal range marked with green arc, caution range marked with yellow arc, 140 to 160 m.p.h.)
Flap Extension and Operation	90 m.p.h. (flap operating range marked by a white arc)

All airspeeds are true indicated

FLAP SETTINGS:

For normal take-off	Up – 0°

* The design load factors are 150% of the above and in all cases the structure meets or exceeds design loads.

For shortest take-off ..... Full down – 30°
For landing ..... Full down – 30°

ENGINE OPERATING LIMITATIONS:

Power and Speed ..... 145 b.h.p. at 2700 r.p.m.

Instrument Markings:

Oil Temperature ..... 225°F. maximum

Oil Pressure:
Minimum Idling ..... 5 p.s.i.
Normal Operating ..... 30 to 40 p.s.i.

Fuel Pressure:
Minimum ..... 1 p.s.i.
Normal Operating ..... 1½ to 3 p.s.i.
Maximum ..... 6 p.s.i.

Tachometer:
Normal Operation ..... 2200-2450 (green arc)
Cautionary Range 2450-2700
Maximum Allowable ..... 2700 (red line)

WEIGHT AND BALANCE:

The safety of an airplane is directly affected by its weight and balance simply because the airplane was designed for a certain limit load and balance condition. The weight and balance limitations for the 170 is as follows:

Gross Weight Limit ..... 2200 pounds

Center of Gravity Limits:
From +36.3 inches aft of firewall datum.
To +45.2 inches aft of firewall datum.

The horizontal datum is the forward face of the firewall with measurements considered + (aft) and – (forward) of this line.

To level the airplane during weighing, use the lower edge of the upper door sill.

A weight and balance report is furnished with each airplane which gives the weight and balance of that particular airplane. Also, an equipment list is furnished with the airplane which shows weights and arms for various equipment and accessory items.

The actual loading of the airplane is up to the pilot. 2200

lbs. gross weight is not to be exceeded – and the useful load in the airplane can be distributed in any way the pilot desires, that is, in baggage (up to the baggage compartment placard limit), gasoline, or passenger load. These are all variables including the pilot's weight, and of course, baggage may be carried in the passenger's location instead of a passenger. It is the responsibility of the pilot and operator to see that the weight and balance are within limitations.

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 2200 lbs. with McCauley propeller installed, and full throttle for take-off and climb. Performance figures are for zero wind velocity and hard surface level runway. Speeds are true indicated airspeeds.

Item	Altitude	Outside Air Temperature					
		0°F	20°F	40°F	60°F	80°F	100°F
Take Off Distance (Ft.)	Sea Level	1460	1580	1700	1820	1930	2050
To clear 50 ft. obstacle	2000 Ft.	1780	1910	2050	2190	2340	2500
Airspeed 76 MPH Take-off	4000 Ft.	2140	2290	2450	2610	2790	3000
Full Throttle, Flaps Up	6000 Ft.	2550	2740	2930	3140	3360	3620

Take Off Correction: Reduce above distances 10% for each 6 MPH Wind Velocity. Ground run approx. 40% of distances shown.

Landing Distance (Ft.)	Sea Level	1580	1640	1700	1755	1810	1860
Over 50 ft. obstacle	2000 Ft.	1685	1745	1805	1860	1915	1965
Approach at 71 MPH	4000 Ft.	1790	1850	1910	1970	2020	2075
Flaps Down	6000 Ft.	1900	1955	2020	2075	2130	2180

Landing Correction: Reduce above distances 10% for each 6 MPH Wind Velocity. Roll approx. 45% distances shown.

Normal Rate Climb	Airspeed	89	Sea Level	760	740	715	690	670	645
(Feet Per Minute)		86	2000 Ft.	670	645	625	600	580	555
Flaps Up		84	4000 Ft.	580	555	535	510	485	465
Full Throttle		81	6000 Ft.	490	465	440	420	395	370

Stalling Speed M.P.H. T.I.A.S.	Condition	Angle of Bank Degrees 0°	20°	40°	60°
No Stall	Power Off; Flaps Up	59	61	68	84
Warning	Power Off; Flaps Down	55	57	63	78
Evident	Power On; Flaps Up	53	55	61	74
	Power On; Flaps Down	47	48	54	67

CLIMB:

The rate of climb and speed for best climb at various altitudes for gross weight of 2200 lbs. and equipped with metal McCauley propeller is given in the table below:

Attitude (ft.)	Sea Level	2500′	5000′	7500′	10,000′	12,500′	15,000′
Best Climb Speed (T.I.A.S.)	89	86	82	79	75	72	68
Rate of Climb (ft./min.)	690	590	485	380	277	173	68

(1) Density altitude.

(2) Gross weight 2200 with McCauley propeller.

The above table is for standard conditions.

the airplane to be trimmed to fly level for a wide selection of load and speed conditions.

FLAPS:

Flaps installed on the 170 are raised or lowered with the flap handle located between the two front seats. Flaps may be lowered or raised during normal flying whenever the airspeed is less than 90 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 will be of assistance, applied just before the airplane is ready to leave the ground. The flaps should not be released until an altitude of at least 100 feet above the highest obstacle has been obtained.

Figure 8 — Cabin Interior

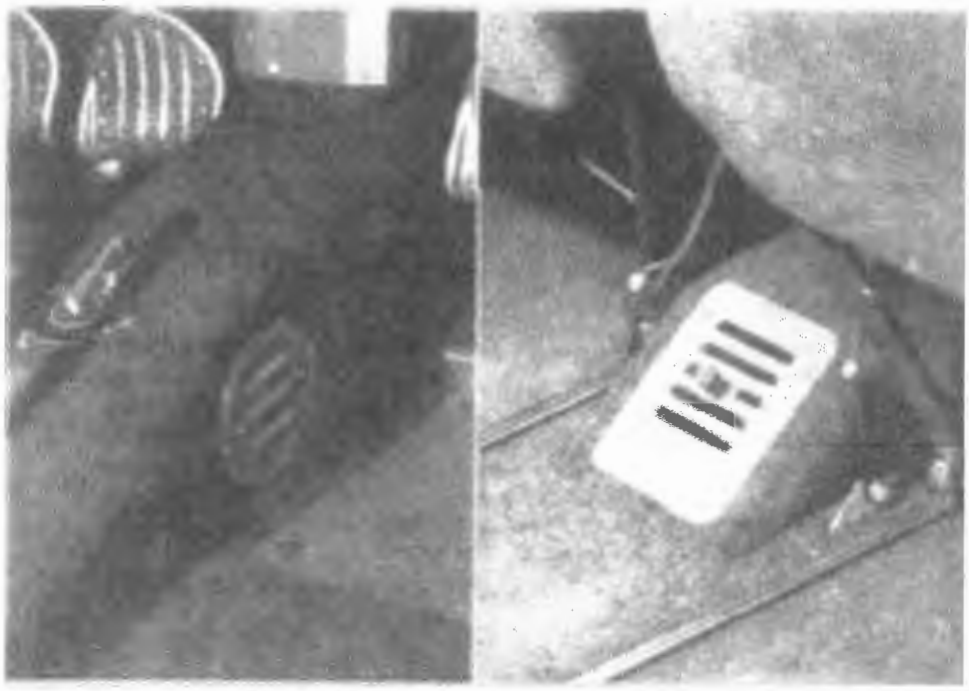

Figure 10 — Cabin Heater Installation

TAKE-OFF

The shortest take-off run can be obtained by keeping the tail low during the whole procedure. The tab can be set to assist in this. With the tail just a little off the ground the wings begin to provide lift quickly. The airplane "breaks ground" approximately at 50 m.p.h. and accelerates rapidly with complete control. From this point the best rate of climb can be easily established. For a long climb at full throttle 85 to 95 m.p.h. is recommended.

GROUND HANDLING:

Proper tie down and ground handling (for instance, pushing and pulling the airplane around on the ground) are necessary if the airplane is to remain always airworthy.

Sufficiently strong (700 lbs. tensile strength) ropes fastened to suitably set tie down rings in the ground are required as shown in Figure 11 to properly fasten the airplane and prevent strong gusty winds from damaging the airplane. Also as mentioned in the fore part of the book, adequate measures must be taken to