ABBREVIATED CHECKLIST

(A complete and more detailed checklist including the pre-flight inspection, can be found in Section III.)

START

1) Master Switch - ON
2) Magneto Switches - ON (2)
3) Throttle - CRACKED OPEN (1/2" - 1")
4) Carburetor/Alternate Air - COLD
5) Mixture - FULL RICH
6) Prime - AS REQUIRED
7) Mixture - (7KCAB ONLY) IDLE CUT-OFF
8) Propeller - CLEAR, front and rear
9) Brakes - CHECK FIRM and SET
10) Starter - ENGAGE (7KCAB ONLY - Mixture FULL RICH after engine fires)
11) Throttle - 1000 - 1200 RPM
12) Engine Instruments - CHECK for proper indications
13) Lights/Radio Switches - AS DESIRED

TAKE-OFF

1) Controls - CHECK free
2) Trim - SET for take-off
3) Flaps - (7GCBC ONLY) SET as desired
4) Fuel Valve - ON
5) Mixture - FULL RICH
6) Engine Run-up - CHECK, magnetos, carburetor/alternate heat, instruments
7) Flight Instruments - CHECK and SET
8) Fuel Boost Pump - (7KCAB ONLY) ON
9) Cabin Door/Windows - CLOSED and LATCHED
10) Seat Belts/Shoulder Harness - FASTENED
11) Climb Speed - 75 - 80 MPH (Best Rate - 69 MPH)

CRUISE

1) Throttle - SET as desired
2) Fuel Boost Pump - (7KCAB ONLY) OFF
3) Mixture - LEAN below 75% power

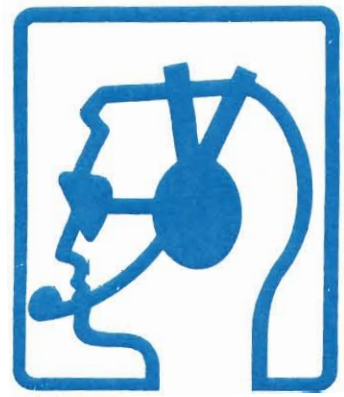
LANDING

1) Mixture - FULL RICH
2) Fuel Boost Pump - (7KCAB ONLY) ON
3) Flaps - (7GCBC ONLY) AS DESIRED
4) Brakes - CHECK FIRM, Park Brake - OFF
5) Approach Speed - 60 - 70 MPH

SHUT-DOWN

1) Brakes - SET
2) Mixture - IDLE CUT-OFF
3) Electrical Switches - ALL OFF

BELLANCA



PILOT'S

OPERATING MANUAL

CITABRIA

OWNER'S MANUAL

CITABRIA

This Book is the Property of:

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

TELEPHONE _____

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OWNER'S MANUAL

Including Mechanic's Service Manual

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Part II

Mechanic's Service Manual

SECTION A. RIGGING INSTRUCTIONS

SPECIAL NOTICE!

— *WARNING* —

Do not under any conditions, fly this aircraft inverted with less than six (6) quarts of oil; or with oil pressure under 60 PSI.

Any deviation will invalidate all warranty of affected engine.

Section A

DESCRIPTION

One of the first steps in obtaining the utmost performance, service and flying enjoyment from your Citabria is to familiarize yourself with your airplane's equipment, systems and controls. This section will aid you in this familiarization.

A-1. ENGINE. Your Citabria is powered by a smooth, dependable Lycoming engine. Depending on the model of your airplane, it is equipped with one of the following engines:

AIRPLANE MODEL	LYCOMING ENGINE MODEL	RATED POWER
7ECA	0-235-C1	115 hp @ 2800 rpm
7GCBC 7GCAA	0-320-A2B	150 hp @ 2700 rpm
7KCAB	I0-320-E2A	150 hp @ 2700 rpm

All of the above are horizontal-opposed, four-cylinder engines utilizing wet sump oil systems and dual magneto ignition. All engines except the 10-320-E2A use a float carburetor. The 10-320-E2A engine is fuel-injected, and is equipped with a Champion modification of the oil system to permit limited inverted operation without loss of oil pressure. For further information on your engine, consult the engine Operator's Manual furnished with your airplane.

A-2. AIRFRAME. Your Citabria is a two-place, tandem, strut-braced, high-wing monoplane. The fuselage consists of a welded steel frame covered with fabric. Wings are fabric-covered, with formed aluminum ribs. The wooden wing spars are hand-crafted from a select grade of Sitka Spruce, and are properly protected to give many years of trouble-free service.

A-3. LANDING GEAR. Each Citabria is equipped with a two-piece, spring steel landing gear which insures sturdy yet smooth handling on rough fields. Much of the landing shock is absorbed by the spring gear, thereby reducing fatigue on the rest of the airframe and wing structure. The spring gear contains no moving parts, and is thus nearly maintenance-free: Ease in ground handling is assured with a steerable tail wheel.

A-4. ENGINE CONTROLS.

a. **THROTTLE.** The throttle control is in a quadrant on the left side of the cockpit, with separate controls for front and rear

seats. An adjustable friction nut is provided within the quadrant to prevent throttle creeping. To increase power, the throttle knob is pushed forward.

b. MIXTURE. The mixture control is located on the extreme left of the instrument panel. To lean the mixture, the knob is pulled out as necessary. Consult your Engine Operator's Manual for correct leaning procedure. On the fuel-injected Model 7KCAB, pulling the mixture control completely out provides an idle cut-off fuel control.

c. CARBURETOR HEAT. Carburetor heat controls for front and rear seats are directly below the throttles. Carburetor heat is provided by pulling the control knob to the rear.

A-5. ELECTRICAL SYSTEM.

a. BATTERY. To operate the electrical equipment when the engine is not running, your airplane is equipped with a conventional lead-acid aircraft storage battery. On airplanes with the Model 0-235-C1 engine, the battery is forward of the firewall in the engine compartment. On other models, the battery is behind the baggage compartment. The rear baggage compartment panel is easily removable for battery service.

CAUTION: Overfilling Battery May Cause Acid Leakage During Aerobatics. See Section D For Special Service Instructions.

b. ALTERNATOR. To maintain battery charge and operate electrical accessories when the engine is running, your airplane is equipped with a 40-amp alternator. The alternator provides charging current at all times, and has sufficient capacity to operate all electrical equipment without battery drain.

c. REGULATOR. Output of the alternator is controlled by the voltage regulator. The regulator also protects the alternator circuit against overload and should be adjusted only by a qualified mechanic.

d. ELECTRICAL PANEL. All electrical switches except the starter are on an electrical panel located on the upper left side of the cabin.

e. MASTER SWITCH. The master switch is on the far right side of the electrical panel, and activates the master switch solenoid, which connects the battery and alternator to the rest of the electrical system. Electrical equipment will not operate with the master switch off; however, the engine will run with the master switch off, since ignition is provided by the magnetos.

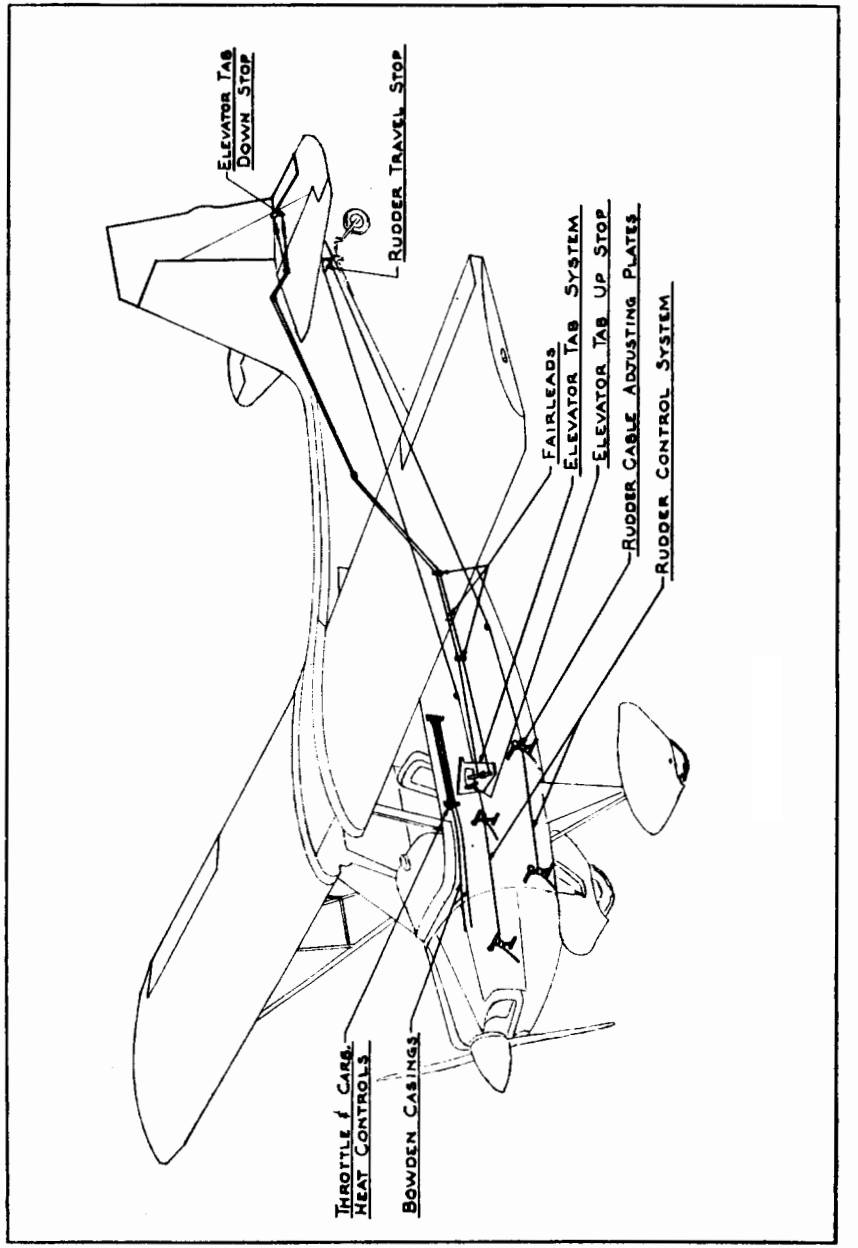


Figure 6.

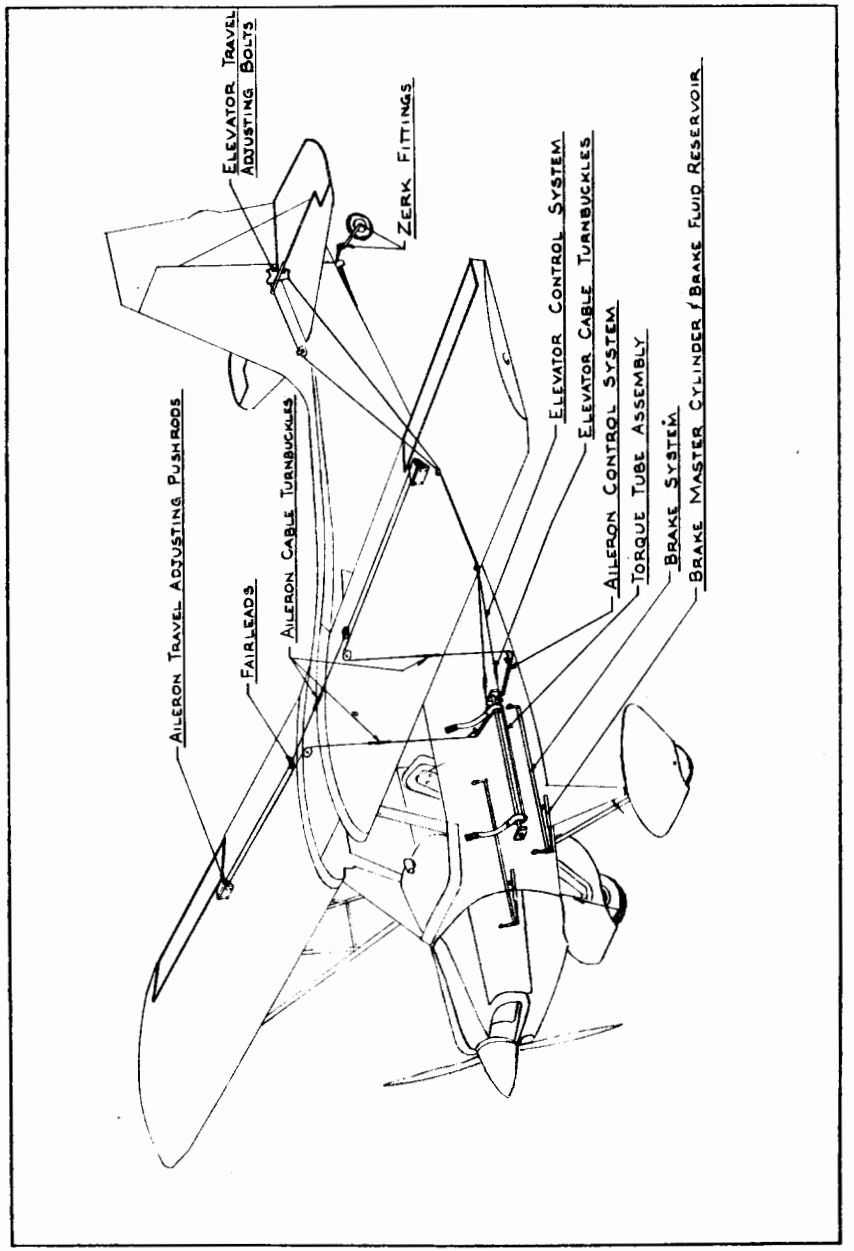


Figure 5.

f. IGNITION SWITCHES. Ignition switches for the left and right magnetos are to the left of the master switch. Since ignition is provided by the magnetos, the ignition switches must be on to operate the engine.

g. EQUIPMENT SWITCHES. Switches for operation of standard electrical equipment—navigational lights, landing light, and emergency fuel pump (7KCAB only)—and optional equipment such as radios, electric turn and bank, etc., are to the left of the ignition switches.

h. FUSES. Each electrical accessory is protected by a separate fuse directly above the electrical switch. Spare fuses are also provided on the electrical panel. To check fuse, push in and twist fuse cap counterclockwise to release cap from electrical panel. If the wire strand inside the fuse is loose or broken, either the fuse is defective or the circuit load has exceeded the fuse rating. To avoid circuit damage, always use a correctly-rated fuse for replacement.

i. STARTER SWITCH. A pushbutton switch in the center of the bottom instrument panel operates the electrical starter. The master switch must be on to operate the starter.

j. AMMETER. The ammeter is approximately in the center of the instrument panel.

A-6. PROPELLER. Your Citabria is equipped with a fixed-pitch, forged, aluminum alloy McCauley propeller. This propeller will provide smooth engine operation with little or no maintenance. The 1C172AGM7254 prop is standard for 150-hp Citabrias, and the 1C90CLM7246 is standard prop for 115-hp Citabrias. Other props are available to provide increased performance in certain areas. For specific recommendations and limitations, consult Champion Aircraft Corporation or FAA Aircraft Specification A-759.

A-7. SEATS. Front and rear seats are of welded steel tubing construction and are bolted directly to the fuselage frame for maximum strength. Seat cushions are removable to permit use of seat pack or back pack parachutes.

A-8. BRAKES. Your airplane's hydraulic brakes are operated from front or rear seat by heel-type pedals behind the rudder pedals. Each brake is controlled by a separate cylinder under the floorboards behind the front brake pedals. These cylinders are vented overboard to prevent loss of brake fluid inside the aircraft during inverted operation. A parking brake, under the right side of the instrument panel, is provided to temporarily secure the aircraft. To operate the parking brake, depress and hold brake pedals, pull parking brake handle firmly to rear, then release pedals. To release brake, depress pedals, push handle forward, then release pedals.

CAUTION: Operating The Parking Brake Handle Without Depressing The Brake Pedals May Cause Damage To The Brake System.

A-9. AEROBATIC DOOR. As an added safety feature, your Citabria is equipped with a special molded-fiberglass door which can be jettisoned in flight in case of emergency. The door is secured by 1. hinges on the forward edge; 2. a secure, lock-equipped latch mechanism on the rear edge; and 3. an aerobatic safety latch (optional) on the top edge. Each door is equipped with an integral arm rest and a handy map pocket. The emergency door release is near the forward edge of the door. To operate the door release, pull firmly to remove the safety locking pin, then push the red handle forward and down as far as possible. This removes the forward door hinge pins and makes it possible to push the door free of the aircraft.

A-10. INSTRUMENTS. All instruments except the fuel gauge (see description of fuel system) are on the instrument panel directly in front of the pilot. Basic instruments are marked with green arc for normal operating range, a yellow arc for the caution range, and radial red lines for maximum permissable values. On flap-equipped airplanes, a white arc on the airspeed indicator indicates the flaps-down operating range. Specific markings for individual instruments are given in Section C. Electrical instruments (electric turn and bank, etc.) are controlled by switches on the electrical panel.

A-11. LEFT SIDE WINDOW. The cabin left side window is secured by a cam-type latch, and may be opened in flight at or below 130-mph. The window is prevented from opening more than approximately 30 degrees by a hinged stop on the forward edge.

A-12. VENTILATORS. Cabin ventilation is provided by two rotating-scoop ventilators located on either side of the forward cabin. To adjust the vents, squeeze inward on the flanges and rotate scoop as desired—forward for fresh air intake and rearward for exhaust.

A-13. FLIGHT CONTROLS. Your Citabria is equipped with dual flight controls in the form of conventional stick and rudder pedals.

A-14. PARACHUTES. (Optional) For aerobatics in your Citabria seat-pack or back-pack parachutes may be installed by removing the seat cushions.

A-15. GREENHOUSE ROOF. As optional equipment all models may be equipped with a green-tinted plexiglas roof extending from the windshield to just behind the pilot. The greenhouse provides improved visibility for aerobatics and normal flight.

A-16. SEAT BELTS AND SHOULDER HARNESSES. All airplanes are equipped with approved adjustable seat belts having

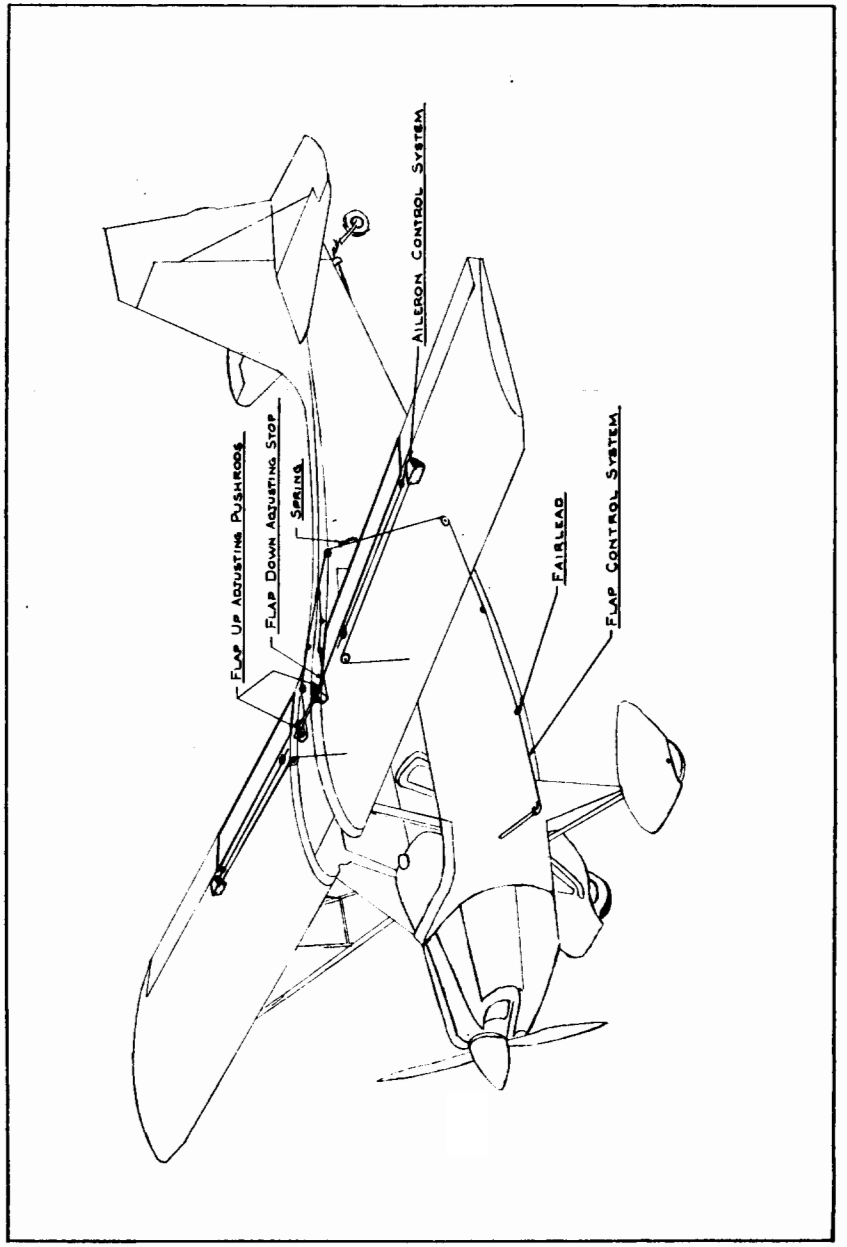


Figure 4.

5. **FLAP RIGGING.** Using the pushrods in left and right wing gaps, adjust neutral position of flaps by reference to the wing butt ribs. Adjust down travel with adjusting bolt in left wing gap. With full flaps, adjust cable and turnbuckle until flaps contact down stop.

Control Surface Rigging

CONTROL SURFACE	MODEL	TRAVEL LIMITATIONS (in degrees from neutral)	CABLE TENSION
Ailerons	7ECA 7KCAB 7GCAA 7GCBC	Up 27.5° +0° —2° Down 19.0° +)° —2°	15-22 lbs. 20-30 lbs.
Elevators	7ECA 7GCAA 7KCAB 7GCBC	Up 24.0° +0° —2° Down 24.0° +2° —2° (1) Up 28.0° +1° —1° Down 24.0° +2° —2°	25-30 lbs.
Elevator Tab	7ECA 7GCAA 7KCAB 7GCBC	Up 17.5° +2° —0° Down 37.5° +2° —0° (2) Up 17.5° +2° —0° Down 44.0° +1° —1°	15-20 lbs.
Rudder	7ECA 7GCAA 7GCBC 7KCAB	Left 25.0° +0° —2° Right	See Rudder Rigging Procedure
Flaps	7GCBC	Down 35.0° +1° —1°	See Flap Rigging Procedure

metal-to-metal buckles. Special 3-inch seat belts and shoulder harnesses are available as optional equipment for aerobatics.

A-17. PITOT-STATIC TUBE. Pitot and static pressures for operation of airspeed indicator, altimeter, etc., are provided by the pitot-static tube which is clamped to the right front jury strut. This tube should be checked frequently for alignment and to insure that holes are not plugged.

A-18. TRIM TABS. The adjustable elevator trim tab control, on the left side of the cabin between the front and rear seat, provides a handy means to trim the aircraft for hands-off flight in almost any attitude. Rudder trim for cruise flight is provided by a ground-adjustable rudder tab.

A-19. FLAPS. On the Model 7GCBC only, trailing edge flaps are provided to permit better speed and altitude control for take-offs and landings. Extension of flaps lowers the stall speed and increases lift and drag, thus making possible a steeper angle of climb or glide. The flaps can be extended to 7°, 14°, 21°, 28° or 35° by pulling the flap handle, located to the left of the pilot, as far as desired. To release flaps, push button on top of flap handle and release as desired. Permissible flap extension speeds are shown by a white arc on the airspeed indicator. See Section B for recommended uses of flaps.

A-20. HEATER. To provide cabin heat in your Citabria, fresh air is heated by exhaust shrouds, then ducted to the front of the cabin. An optional rear seat heater provides additional heat to the rear of the cabin whenever carburetor heat is not in use. Push-pull heater controls are on the left side of the lower instrument panel.

A-21. BAGGAGE COMPARTMENT. A spacious baggage compartment behind the rear seat accommodates up to 100 pounds of luggage, guns, fishing equipment, and many other items.

A-22. ENGINE OIL SYSTEM. On all models, the oil system is a conventional wet sump pressure system. Oil is picked up from the integral sump by the engine-driven pump and forced through the engine. Oil returns to the sump due to gravity. Oil quantity is checked with the dipstick which screws into the crankcase on the right side of the engine. Except on the Model 7KCAB, more than momentary inverted operation will cause loss of oil and oil pressure.

On the Model 7KCAB, the engine is modified by Champion to prevent loss of oil when inverted and to provide inverted oil pressure. A baffle, with a trap door which closes when the engine is inverted, is placed between the engine and the sump, thus trapping a limited amount of oil in the sump. The oil pickup tube, which is hinged and free to swing, then comes to rest on the baffle surface and picks oil up from that position. When the quantity of oil

trapped in the sump is used up, oil pressure will decrease. The oil separator on the firewall prevents oil from escaping through the engine breather when inverted. The engine crankcase is vented from the bottom of the oil sump through the separator during inverted operation.

A-23. AIR FILTER. A carburetor air filter, located in a recess in the front of the cowling, filters all air entering the engine unless the carburetor heat is on.

A-24. TIRES. Your Citabria is equipped with conventional aircraft type 7.00x6 6-ply tires. For off-runway use, larger tires may be used by removing the wheel fairings.

A-25. EXHAUST SYSTEM. A low back pressure stainless steel exhaust system is standard equipment on all Citabrias. The crossover manifold system routes the cylinder exhaust thru heat exchangers on each side of the engine—left side is front cabin heat, right side is carburetor heat and rear cabin heat.

A-26. FUEL SYSTEM. Since all models except the Model 7KCAB use essentially the same fuel system, the description below applies to all models except as noted in paragraph i—"Inverted Fuel System—Model 7KCAB."

a. **FUEL TANKS.** Welded aluminum fuel tanks are in the inboard section of each wing. 150-hp airplanes have two 19.5-gal. tanks as standard, and 115-hp airplanes have two 13-gal. tanks as standard or two 19.5-gal. tanks as optional. Tank quantity is shown on the fuel caps.

b. FUEL DRAINS. The entire fuel system can be drained as follows: 1. Wing tank sumps are drained by removing a ¼-in. pipe plug from the tank bottom; 2. Fuel lines between the tanks and the gascolator are drained from a quick-drain on the belly of the aircraft; 3. The gascolator is drained with a quick-drain on the gascolator bowl.

c. GASCOLATOR. A drainable gascolator is on the firewall in the engine compartment. The sediment bowl is removable for cleaning and replacement of the fuel filter.

d. FUEL SHUT-OFF VALVE. The fuel shut-off valve, which prevents fuel from entering the engine compartment, is on the lower left cabin side of the firewall. The valve is conveniently controlled by a handle under the left-hand corner of the insturment panel. To turn fuel on, turn handle clockwise until definite resistance is felt.

e. FUEL GAUGE. Fuel quantity, expressed as a fraction of the total fuel, is read from a mechanical float-type gauge located on the right side of the cabin over the door. The gauge indicates correctly only in level flight attitude. Since the fuel tanks are in-

Part II

MECHANICS SERVICE MANUAL

SECTION A. RIGGING INSTRUCTIONS

A-1. DATUM. The datum for all Citabrias is the wing leading edge.

A-2. LEVELING THE AIRPLANE. To level the airplane, drop a plumb line from the wing leading edge. Adjust tail height until plumb bob point rests 10.18 inches ahead of the front face of the fuselage wing strut fitting.

A-3. WING RIGGING. The +2 degree angle of dihedrol is fixed by the length of the front strut. The +1 degree angle of incidence is fixed at the wing root fittings on the fuselage in the manufacture of the airplane. The angle of incidence at the rib nearest the strut point attachment fitting of the wing may be adjusted to agree with the angle of incidence at the root by means of the screw adjustment at the lower end of the rear strut. If the airplane exhibits wing heaviness in flight, adjust the rear strut length. Wash out (reduce tip incidence). The light wing one degree; then, if necessary, wash in the heavy wing.

A-4. CONTROL SYSTEM RIGGING. Control surface rigging includes adjustment of control surface travels and cable tensions. Table on page 32 gives travels and tensions. A bubble protractor and a cable tensiometer should be used to adjust and check rigging.

1. AILERON RIGGING. Adjust aileron travel with the adjustable pushrod at the aileron. Adjust cable tension with ailerons in neutral, using turnbuckle in cabin. (See figure 5). Permissable aileron droop is 0 to 3/16 inch.

2. ELEVATOR RIGGING. Adjust elevator travel with stop bolts inside metal cover on vertical fin. Adjust cable tension with elevator down using the turnbuckles aft of the torque tube assembly. (See figure 5). Check for positive clearance between stick and front and rear seats.

3. ELEVATOR TRIM TAB RIGGING. Adjust tab down travel with stop bolt at tab arm and turnbuckles at tab. Adjust up travel with stop plate at tab control quadrant in cabin. Adjust cable tension using turnbuckles with elevators and tab in neutral.

4. RUDDER RIGGING. Adjust rudder travel by filing or building up stops on the vertical fin post. With rudder locked in neutral, tension on left and right cables should be within 3 lbs. of each other. Also, tension of right cable with full left rudder and visa versa should be within 3/16" of each other. Cable tension is varied with adjusting plates at the rear rudder pedals.

E-5. INDICATED AIR SPEED VS. TRUE INDICATED AIR SPEED

Air Speed vs. True Indicated Air Speed

Champion Models 7GCAA and 7KCAB

I.A.S., mph	T.I.A.S., mph
50	58
60	66
70	75
80	83
90	92
100	100
110	109
120	117
130	125
140	144
150	142
160	150
170	159

terconnected, both tanks will always contain the same amount of fuel (except immediately after adding fuel to one side), and thus only one tank gauge is necessary. A separate, similar gauge for the left wing tank is optional.

f. ENGINE PRIMER. (Except Model 7KCAB). The direct-pump engine primer is on the right side of the lower instrument panel. The primer injects raw fuel directly into the intake manifold adjacent to two cylinders for easier starting. To operate, first unlock the plunger by rotating the knob in either direction while pulling slightly until knob pops out. To provide one stroke of prime, move knob slowly all the way out, then all the way in. Lock the primer all the way in after use.

g. VENT SYSTEM—19.5-GAL. TANKS. Fuel tank air spaces are interconnected, and positive venting is provided through a tube which protrudes from the bottom of the left wing just outboard of the tank. A one-way check valve is provided at the vent outlet of each tank to minimize inverted fuel loss.

VENT SYSTEM—13-GAL. TANKS. The vent system for the 13-gal. tanks is similar to the above except that the vent protrudes from the top of the left wing inboard of the tank and check valves are not used.

h. SYSTEM OPERATION. (Except Model 7KCAB). Fuel drains from the tanks to the engine only due to gravity, and thus any inverted operation will cause fuel starvation.

i. INVERTED FUEL SYSTEM—MODEL 7KCAB. The Model 7KCAB inverted fuel system differs from the system described above in the following ways:

1. FUEL PUMPS. Since the Model 7KCAB is fuel-injected, two fuel pumps are required: 1. an engine-driven, cam-operated pump, which operates whenever the engine is running to supply fuel at proper pressure to the fuel injector; and 2. an emergency electric pump, on the firewall in the engine compartment.

2. PRIMER. Since the engine in the Model 7KCAB is fuel-injected, a regular primer is unnecessary. To prime the engine, turn on the master switch and the electric fuel pump with throttle closed and mixture in idle cut-off. To provide one stroke of prime, move mixture control to full rich and back to idle cut-off. This injects fuel directly into the cylinders.

3. FUEL PRESSURE GAUGE. The fuel pressure gauge on the right side of the instrument panel, indicates the fuel pressure at the injector inlet.

4. HEADER TANK. To provide limited fuel in the inverted position, a 1.5-gal. header tank is located in the forward

cabin under the instrument panel. The outlet from the header tank consists of a standpipe located at the center of the tank. Thus, half of the tank capacity can be used in the inverted position.

A-27. UTILITY OPTIONS. The following items are available as optional equipment to adapt your Citabria for a variety of uses.

a. FLOATS. (MODEL 7GCBC ONLY). The Model 7GCBC is approved on Edo Model 89-2000 floats at a gross weight of 1800 lbs. Low power and wing loading give this package very spirited performance.

b. SKIIS. All models are approved on Flui - Dyne Model A2000A skiis.

c. PHOTO DOOR. All models can be equipped with a special door which can easily be opened in flight for photography, etc. The photo door resembles a standard door which has been split in the center from front to rear. The bottom half operates like a standard door. The top half is hinged on the top edge instead of the front edge, and may be held fully open by a catch on the bottom of the wing. To close the photo door, close the top half first, then the bottom half.

E-5. TAKE-OFF DISTANCE AND RATE OF CLIMB VS. ALTITUDE AND TEMPERATURE.

Champion Models 7ECA, 7GCBC, 7GCAA and 7KCAB

MODEL		7ECA			7GCBC			7GCAA & 7KCAB		
POWER		115 hp.			150 hp.			150 hp.		
PROP		1C90ALM7246			1C172AGM7254			1C172AGM7254		
Pressure Altitude, Ft.	Temp., °F	T.O. Dist. Ft.	50 Ft. Obst., Ft.	R/C, Ft/Min	T.O. Dist. Ft.	50 Ft. Obst., Ft.	R/C, Ft/Min	T.O. Dist. Ft.	50 Ft. Obst., Ft.	R/C, Ft/Min
S. L.	0	340	716	800	231	457	1240	289	535	1210
	20	372	768	775	254	491	1210	317	574	1180
	40	415	832	750	279	530	1170	350	618	1150
	60	455	895	725	305	567	1145	382	663	1120
	80	496	961	700	340	616	1110	417	713	1090
	100	544	1034	675	363	649	1090	453	763	1060
2000	0	407	860	685	272	536	1100	343	622	1080
	20	444	929	660	294	573	1070	376	671	1050
	40	492	1004	635	331	629	1030	414	727	1020
	60	543	1086	610	374	684	1010	452	784	990
	80	597	1174	585	397	733	980	497	846	960
	100	655	1269	560	433	777	950	538	904	930
4000	0	482	1043	575	324	635	980	401	738	950
	20	538	1147	545	360	695	930	448	806	920
	40	589	1239	520	393	746	900	479	857	890
	60	640	1329	495	458	834	870	527	925	860
	80	690	1432	470	474	870	840	573	991	830
	100	788	1580	450	522	935	820	643	1086	800
6000	0	576	1301	465	385	763	840	479	886	820
	20	640	1432	435	421	827	800	529	962	790
	40	707	1562	410	472	905	770	582	1040	760
	60	789	1716	385	522	981	740	647	1133	730
	80	858	1858	365	568	1048	720	706	1226	700
	100	968	2058	340	626	1137	690	760	1304	680
8000	0			350			700			690
	20			325			670			660
	40			300			640			630
	60			275			610			600
	80			245			580			570
	100			225			550			540

All figures are for maximum performance at gross weight. Take-off in 7GCBC made with 2 notches of flap until airborne. Take-off performance on dry pavement.

MAJOR SURFACES

Model	7ECA-7GCAA-7KCAB	7GCBC
Wing	165.00	170.22
Aileron	16.54	16.54
Flap		18.36
Stabilizer	12.25	12.25
Elevator	13.75	13.75
Elevator Tab	0.83	0.83
Fin	7.02	7.02
Rudder	6.83	6.83
Wing Dihedral	+ 2 degrees	
Wing Incidence	+ 1 degree	
Stab. Incidence	— 5 degrees	
Vertical Fin Offset	0.5 in. Left	

Section B

OPERATING INSTRUCTIONS

B-1. PREFLIGHT INSPECTION.

a. Check ignition switches off.

b. On first flight each day, drain gas from aft fuselage drain and gascolator drain.

c. Check gas quantity by gauge and visually.

d. Release all tiedown ropes.

e. Check all control surface hinges and actuator attachments when possible.

f. Check tires for cuts, bruises, and proper inflation.

g. Check pitot-static tube for contamination.

h. Check oil quantity.

i. Check propeller and spinner for nicks and security.

j. Check windshield and windows for cleanliness.

B-2 STARTING THE ENGINE. (MODELS EXCEPT 7KCAB).

a. **ENGINE COOL.** (Moderate air temperature).

1. Mixture full rich.

2. Gas on.

3. Prime about two strokes or as necessary.

4. Master switch on.

5. Ignition switches on.

6. Throttle open slightly—¼ to ½ in.

7. Brakes on.

8. Engage starter (do not operate starter continuously for more than 15 seconds).

9. If no oil pressure 30 seconds after start, stop engine and determine cause.

b. **ENGINE HOT.** For a hot engine, the procedure above should be followed except that priming is normally unnecessary. A hot engine can be easily flooded. If this occurs, open the throttle completely and turn the engine over until it fires. As engine starts, retard throttle to normal idle position.

c. **COLD WEATHER STARTING.** In very cold weather, follow the normal procedure except that 1. engine may be turned

over three or four times by hand to loosen oil, etc., before starting; and 2. several additional strokes of prime may be necessary, and in very cold weather it may be necessary to pump the primer for a short time after the engine starts.

B-3. STARTING THE ENGINE—MODEL 7KCAB. The basic procedure for starting the Model 7KCAB engine is given below. For hot engine and cold weather starting, see Section B-1., b., c.

a. Gas on.

b. Master switch on. Ignition switches on.

c. Mixture—idle cut-off.

d. Prime about two strokes or as necessary (see page 7 for priming instructions).

e. Emergency fuel pump off.

f. Throttle open slightly—¼ to ½ in.

g. Engage starter.

h. When engine fires, move mixture control to full rich.

i. If no oil pressure 30 seconds after start, stop engine and determine cause.

B-4 BEFORE TAKEOFF.

a. Set altimeter for field elevation.

b. Set elevator trim tab approximately vertical.

c. Hold brakes and increase throttle to 2000 rpm.

d. Momentarily switch off each magneto and note rpm. Drop should not exceed 175 rpm. and drops on either mag should be within 50 rpm. of each other.

e. Check carburetor heat—approximately 75 rpm. drop.

f. Check oil pressure—60-90 psi.

g. Check full throttle engine rpm. only if the condition of the engine is questionable. See Section E-3 for permissible static rpm. limits.

h. Check for freedom of all flight controls.

i. Check auxiliary door latch (when installed).

j. Seat belts fastened (rear seat belt fastened around seat if solo).

Engine — Battery — Fuel System

Model	ENGINE	HP & RPM.	Propeller (McCauley)	Static RPM Limits	Battery & Location	Std. Fuel Sytem (Gal.)
7ECA	Lycoming O-235-C1	115 @ 2800	1C90CLM 7246	2225-2425	Gill or Equiv. 6-GCAB-9 FireWall Mounted	26
7GCAA 7GCBC	Lycoming O-320-A2B	150 @ 2700	1C172AGM 7254	2300-2640	Gill or Equiv. 6-GCAB-11 Mounted Aft Baggage Comp.	39
7KCAB	Lycoming I0-320-E2A	150 @ 2700	1C172AGM 7254	2300-2540	Gill or Equiv. 6-GCAB-11 Mounted Aft Baggage Comp.	39

E-2. MAJOR DIMENSIONS. Aircraft Specification: A759; Production Certificate: 315; AirWorthiness Classification: Standard; Category: Normal, Acrobatic; Certification Basis: 4a; Aircraft Gross Weight: 1650 lbs.

Major Airplane Dimensions, Feet, Inches

Model	7ECA	7KCAB	7GCAA	7GCBC
Length Overall (Level)	22-7	22-8	22-8	22-8
Height Overall (3 Point)	7.75	7.75	7.75	7.75
Height Overall (Level)	8-1	8-1	8-1	8-1
Wing Span	33-5	33-5	33-5	34-5.4
Wing Chord	0-60	0-60	0-60	0-60
Wheel Tread (Static)	6-4.4	6-4.4	6-4.2	6-4.2
Wheel Base (Static, Level)	16-1	16-1	16-1	16-1
Wheel Base (3 Point)	16-4	16-4	16-4	16-4

B-5. TAKEOFF.

a. NORMAL TAKEOFF.

1. Align airplane with runway centerline, insuring that tailwind is tracking straight.

2. Release brakes.

3. Keeping stick slightly aft of control, smoothly open the throttle all the way.

4. As speed increases, use slight forward stick pressure to raise tail to approximately level flight position.

5. Lift off at approximately 1.3 times the power-off stall speed.

b. SHORT FIELD TAKEOFF.

1. Align airplane with runway centerline.

2. Hold brakes and smoothly open the throttle all the way.

3. Release brakes, and use slight forward stick pressure to raise the tail slightly.

4. Lift off at approximately 1.2 times the power-off stall speed.

5. Climb at best angle-of-climb speed.

c. SOFT FIELD TAKEOFF.

1. Align airplane with runway centerline.

2. Release brakes.

3. Keeping stick slightly aft of control, smoothly open throttle all the way.

4. As speed increases, use slight forward stick pressure to raise tail wheel just off the ground.

5. Lift off at approximately 1.2 times the power off stall speed.

B-6 CLIMB.

a. NORMAL CLIMB. When flying cross-country, a climb speed of about 90 mph. IAS will provide good visibility and cooling. Mixture should be left full rich whenever 75 per cent power or more is being used. With full throttle, power will normally exceed 75 per cent up to about 5000 ft. altitude.

b. BEST RATE-OF-CLIMB. The best rate-of-climb speed will provide the greatest possible altitude gain in the least time. It will not provide the steepest angle of climb, and should not be used in a short field takeoff. See Section E for best rate-of-climb speeds.

c. BEST ANGLE-OF-CLIMB. The best angle-of-climb speed will provide the maximum angle of climb with respect to the ground, and should thus be used on a short field takeoff.

B-7. MISCELLANEOUS OPERATING PRACTICES.

a. CARBURETOR HEAT. Avoid using carburetor heat on the ground. With carburetor heat "on", carburetor air is not filtered, and abrasive dirt particles may enter the engine, causing abnormal wear and possible failure. In the air, use carburetor heat only when icing is suspected, i.e., Since carburetor heat causes partial loss of power, do not use heat when landing unless atmospheric conditions indicate that icing is probable, because full power may be needed on a go-around. If carburetor ice is suspected, (a gradual decrease in engine rpm. at the same throttle setting indicates carburetor ice), apply full carburetor heat; a large drop in rpm. means that carburetor ice is probably present. Use full carburetor heat until all ice is dissipated.

b. RUN-UP SURFACE. Avoid using high engine rpm. when on any surface containing loose gravel, stones, etc., as abrasion and damage to propeller blades may result.

B-8. AEROBATICS IN YOUR CITABRIA. Although your Citabria is certificated as an aerobatic airplane, this in itself does not mean that the airplane can "take anything you can give it." Following the suggestions below will make aerobatics in your Citabria (or any other airplane) safer and more enjoyable.

Never attempt any aerobatic maneuver without first receiving dual instruction from a qualified flight instructor. Although aerobatics are very safe when correctly done, a pilot without training or experience can get into trouble doing aerobatics.

Remember, altitude is your best insurance when doing aerobatics. According to Federal Air Regulations, the minimum legal altitude for aerobatics is 1500 feet AGL. Keep in mind that 1500 feet is therefore the minimum recovery altitude from any inadvertent maneuver, and that 1000 feet of altitude are often lost in a three-turn spin.

Always inspect your airplane before flying aerobatics. This should include a thorough pre-flight inspection (see Section B-1) and an inspection of the cabin to insure that no loose articles are present, etc. The rear seat belt should be fastened around the seat when doing solo aerobatics to prevent its catching on the rear stick.

Watch for other traffic while doing aerobatics. Perform a 90-degree clearing turn in each direction before beginning, checking

E-1. AIRCRAFT SPECIFICATIONS—ALL MODELS

MODEL	7ECA	7GCAA Package A	7GCBC Package C	7GCBC 115hp	7GCBC EDO 2000 Floats	7KCAB Package B
Number of Seats	2	2	2	2	2	2
Lycoming Engine, Make, Model	0-235-C1	0-320-A2B	0-320-A2B	0-235-C1	0-320-A2B	I0-320-E2A
Hp @ rpm	115-2800	150-2700	150-2700	115-2800	150-2700	150-2700
Propeller (McCauley)	1C90CLM	1C172AGM	1C172AGM	1C90CLM	1C172AGM	1C172AGM
Gross Weight, lbs.	1650	1650	1650	1650	1800	1650
Empty Weight, lbs.*	1034	1107	1136	1063	1290	1128
Useful Load, lbs.	616	543	514	587	510	522
Useful % of Gross Weight	37.3	32.9	31.2	35.6	28.3	31.6
Standard Fuel Capacity, gals.	26	39	39	39	39	39
Optional Fuel Capacity, gals.	39					
Oil Capacity, qts.	6	8	8	6	8	8
Stall Speed, mph	51	51	50	50	53	51
Stall Speed, Flaps mph			45	45	48	
Top Speed, mph	117	130	128	116	112	130
Cruise Speed @ 75% hp, mph-Alt.	112-7500	125-8000	125-8000	112-7500	103-7500	125-8000
Range @75% hp., gals.-miles,-hrs.	39-728-6.5	39-537-4.3	39-537-4.3	39-728-6.5	39-450-4.3	39-537-4.3
Fuel Consumption @ 75% hp, gph	6	9	9	6	9	9
Rate of Climb, mph-fpm	73-725	73-1120	70-1145	73-775	70-800	73-1120
Service Ceiling, feet	12,000	17,000	17,000	12,000	16,000	17,000
Take-off Run, ft. (Seconds)	450	375	296	425	12 (Sec.)	375
Take-off Over 50 ft. Obstacle, ft.	890	630	525	860		630
Landing Roll, ft.	400	400	310	310		400
Landing Dist. over 50 ft. Obst., ft.	775	755	690	690		755
Wing Area, sq. ft.	165	165	170.2	170.2	170.2	165
Wing Loading, lbs. per sq. ft.	10.0	10.0	9.7	9.69	10.6	10.0
Power Loading, lbs. per hp	14.3	11.0	11.0	14.3	12.0	11.0
Baggage Capacity, lbs.	100	100	100	100	100	100

NOTE: Performance is for gross weight at sea level unless noted.

* Average With Standard Equipment.

Section E

SPECIFICATIONS

and

PERFORMANCE

for traffic all around the airplane. See Part 91 of the Federal Air Regulations for airspace in which aerobatics are prohibited.

Check your airplane weight and balance. The rear c.g. limit for aerobatics (see Section C-6) is present because of undesirable flight characteristics when operating aft of that limit. To exceed the limit is to invite trouble.

Do not do aerobatics unless you are in good physical condition —not when you have a hangover, a cold or any other illness. If you are not in good condition, your reaction time is increased and your tolerance to G-loading is decreased.

Know and respect your airplane's structural limitations. (See Section C).

a. **LOAD FACTOR.** A load factor is a convenient means for expressing the total load on an airplane. Mathematically, the load factor, in G's, is equal to the total lift on the airplane divided by the weight of the airplane. Thus, if you are pulling five G's in a 1650-pound airplane, the airplane is actually lifting 5X1650=6260 pounds. The load factor is indicated in flight by an accelerometer.

b. **LIMIT LOAD FACTOR.** The limit load factor is that load factor which the airplane will take without any permanent deformation, i.e., the airplane will bend under load, but will unbend when the load is removed. If the limit load factor is exceeded, the airplane may not come apart, but it may bend enough so that it will not completely unbend when the load is removed, thus possibly making major repairs necessary. In practice, the limit load factor should be called the never-exceed load factor, and represents the maximum load which the airplane should ever be subjected to in service. In maneuvers which require high G-loads, the pilot should be very careful not to exceed the limit load factor, which is shown on the accelerometer by a red radial line.

c. **ULTIMATE LOAD FACTOR.** Mathematically, the ultimate load factor is equal to the limit load factor times a safety factor, usually 1.5 for airplanes. Thus if an airplane has a limit load factor of five G's, the ultimate load factor is 5X1.5=7.5 G's. Practically speaking, the airplane can withstand at least the ultimate load factor without any catastrophic failure, i.e., if the ultimate load factor is exceeded, the airplane may physically come apart into pieces. Note that the safety factor mentioned above is not designed to allow for pilot error, since it is assumed that the pilot will never exceed the **limit** load factor. This safety factor is designed to allow for engineering error—material variations, stress analysis limitations, etc. In utilizing an airplane's load factor, make sure you know whether it is the limit load factor or the ultimate load factor. If any doubt exists, assume that it is the ultimate load factor and divide it by 1.5 to get the limit load factor.

d. MANEUVERING SPEED. The maneuvering speed is the minimum speed at which rapid full application of the controls would theoretically produce a load equal to the limit load factor. Thus, at any speed below the maneuvering speed, rapid stick movements will not produce the limit load factor. In practice, the maneuvering speed represents the maximum entrance speed for any "snap" maneuver (snap roll, etc.).

e. NEVER EXCEED SPEED. The never-exceed speed is equivalent to the limit load factor—it is the maximum speed expected in service. It is shown by a red line on the airspeed indicator, and, as the name implies, should never be exceeded.

NOTE: In A Citabria, A Slightly Nose-Low Attitude When Inverted Will Allow A Rapid Buildup Of Speed. Watch The Airspeed Indicator When Inverted To Prevent Exceeding The Never-Exceed Speed.

Remember that Federal Air Regulations require that parachutes be worn by all occupants of the airplane when passengers are carried during aerobatics (except as required for pilot rating flight tests). Also, if parachutes are available in the airplane, they must be of an approved type.

If you should ever get into a position from which you cannot recover without exceeding either the never-exceed speed or the limit load factor, it is usually best to recover without exceeding the limit load factor, even if airspeed exceeds the never-exceed speed.

Pay attention to placards in your airplane. In particular, note the aerobatic maneuver placard which is required on all aerobatic category airplanes. This placard lists all maneuvers approved for the airplane, along with recommended entrance speeds. Maneuvers not listed on the placard are not approved. (In the Citabria, all combinations of the listed maneuvers are approved, thus, although a loop with a snap roll on top is not specifically listed, the maneuver is approved because it is a combination of a loop and a snap roll). Inverted flight is generally approved unless placarded otherwise.

Just as in normal flying, aerobatic maneuvers as such are generally not difficult to perform. To perform them smoothly and precisely, however, with the pilot in **complete** command of the airplane at all times, requires many hours of practice.

6. Lift off upper cowl.

7. When replacing cowling, insure that the rubber duct which connects the carburetor air filter to the carburetor air box is installed over the connecting flange.

D-7. FUEL STRAINER. The fuel strainer should be occasionally removed, cleaned, and checked for contamination. On all models, the fuel strainer is located inside the gascolator bowl in the engine compartment. On Model 7KCAB only, an additional screen is provided in the fuel injector. To remove this screen, remove the ~~saftied hex plug~~ on the right side of the injector body.

Fuel Inlet fitting

D-2. BATTERY. Airplanes equipped with the 0-235-C1 engine use a Rebat Model S-25 battery or equivalent; all other models use a Rebat Model R-35 battery or equivalent. All batteries should be checked occasionally for proper acid level, cleanliness of battery, and security of cables and caps. On airplanes used for aerobatics, the following special precautions must be followed to prevent leakage of acid:

1. Maintain acid level only 1/16 in. above the top of the plates.

2. When servicing or installing battery, make a final acid level check after the airplane is flown long enough to completely charge the battery. Charging may cause acid level to rise, thus forcing acid into the battery caps. If battery is inverted with acid inside the caps, acid will run out.

3. Check frequently to insure that caps are tight.

D-3. WINDOWS. The windshield and side windows of your Citabria are made from clear plexiglass. To clean windows, remove dust, bugs, etc., using a soft cloth dipped in mild detergent solution, then polish with any polish recommended for plexiglass. Never clean plexiglass with a dry cloth, as the plastic surface will be scratched by dust particles, etc.

D-4. SAFETY BELTS. Safety belts showing signs of wear or deterioration should be replaced with any of the following models:

1. Cummings and Sanders Model CS-9700 or equivalent with metal-to-metal buckle;

2. Rupert Model 82 (3-in. aerobatic belt); or

3. Any new military belt similar to the Rupert Model 82.

D-5. LUBRICATION. The aircraft owner may perform any lubrication not requiring disassembly other than removal of non-structural items such as cover plates, cowlings and fairings.

D-6. ENGINE COWLING. Screws attaching the cowling to the firewall flange should be checked occasionally for tightness. To remove cowling, proceed as follows:

1. Disconnect landing light wires right side of cowl.

2. Remove all sheet metal screws around periphery of lower cowl.

3. Holding nuts inside cowl, remove machine screws located on each end of strip normally covered by cowl doors on each side.

4. Pull down and forward on lower cowling to remove.

5. Remove machine screws located on aft top edge of upper cowl.

Section C

OPERATING LIMITATIONS

All operating limitations are contained in your airplane in the form of markings, manuals or placards. If any information in this section contradicts that in your airplane, disregard the information from this section.

C-1. CERTIFICATION. Your Citabria is certificated in the Normal and Acrobatic Categories under CAR 4a, and conforms to the listing in Aircraft Specification A-759. All Citabrias are manufactured under Production Certificate 315.

C-2. TYPES OF OPERATION. With standard equipment, your Citabria is approved for VFR flight, day or night. Approved for IFR flight requires additional optional equipment.

C-3. AIRSPEED LIMITATIONS.

Maximum glide or dive speed (red line) .....162 mph CAS
Maximum level flight speed .....120 mph CAS
Maximum maneuvering speed .....120 mph CAS
Maximum flap speed ..... 90 mph CAS

Green arc extends from the flaps-up stalling speed to the maximum level flight speed. Yellow arc extends from the maximum level speed to the red line speed. On the Model 7GCBC, the white arc extends from the flaps-down stall speed to the maximum flap speed. Stall speeds for each model are given in Section E.

C-4. ENGINE OPERATING LIMITATIONS.

LYCOMING 0-235-C1 ENGINE (Models 7ECA, 7GCBC)
Maximum rated power and RPM .....115 hp @ 2800 rpm.

LYCOMING 0-320-A2B or 10-320-E2A ENGINE (Models 7GCBC, 7GCAA, 7KCAB)

Maximum rated power and rpm—all operations 150 hp. @ 2700 rpm.

C-5. ENGINE INSTRUMENT MARKINGS.

LYCOMING 0-235-C1 ENGINE.
OIL PRESSURE GAUGE.
Minimum idling (red line) .....25 psi.
Normal (green arc) .....60-100 psi.
Maximum start and warmup .....100 psi.
Caution (yellow arc) .....25-60 psi.

OIL TEMPERATURE GAUGE.
Maximum (red line) .....245° F.
Normal (green arc) .....100-245° F.
TACHOMETER.
Maximum rpm. (red line) .....2800 rpm.
Normal (green arc) .....1800-2800 rpm.

LYCOMING 0-320-A2B ENGINE.

OIL TEMPERATURE and OIL PRESSURE markings are identical to those for the 0-235-C1 Engine.

TACHOMETER.
Maximum (red line) .....2700 rpm.
Normal (green arc) .....1800-2700 rpm.

LYCOMING 10-320-E2A ENGINE.

OIL TEMPERATURE, OIL PRESSURE, and TACHOMETER markings are identical to those for the 0-320-A2B Engine.

FUEL PRESSURE GAUGE.
Maximum (red line) .....45 psi.
Normal (green arc) .....12-45 psi.
Minimum (red line) .....12 psi.

C-6. AEROBATIC MANEUVERS. The following maneuvers and true indicated entrance speeds are approved for your Citabria:

Chandelles, Lazy Eights	120 mph.	104 K.
Barrel or Slow Roll	120 mph.	104 K.
Immelman	145 mph.	126 K.
Loop or Clover Leaf	140 mph.	122 K.
Split S	60 mph.	52 K.
Snap Roll	65 mph.	56 K.
Vertical Reverse	60 mph.	52 K.
Cuban Eight	145 mph.	126 K.
Spins	Slow Deceleration	

For aerobatics, the rear c. g. is limited as follows:

MODEL	AEROBATIC REAR C. G., INCHES AFT DATUM
7ECA	17.3
7GCBC	16.3
7GCAA	16.0
7KCAB	16.0

ACCELEROMETER MARKINGS—MODELS 7ECA, 7GCAA.
Maximum (red line) .....5.0 G.
Minimum (red line) .....-2.0 G.
Normal (green arc) .....-2.0 to 5.0 G.

Section D

CARE OF YOUR AIRPLANE

Unless you are a licensed mechanic, you may not work on your airplane except as allowed in Part 43 of the Federal Air Regulations. Part 43 does allow you to perform many routine maintenance and repair items, and your attention to these items will greatly increase the service life of your airplane. This section outlines some of the things which you as a pilot may do to maintain your airplane; for complete service information, see Part II of this manual: Mechanic's Service Manual.

D-1. ENGINE OIL.

a. OIL REQUIREMENTS. The following requirements for engine oil are taken from Lycoming Service Letter 1014C. For detailed requirements, consult this service letter.

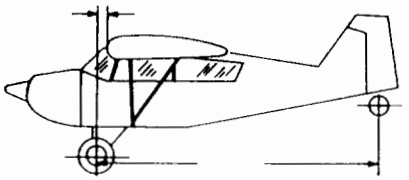
AVERAGE TEMPERATURE	SINGLE VISCOSITY GRADES	MULTI - VISCOSITY GRADES
Above 60° F	SAE 50	SAE 40 or SAE 50
30° to 90° F	SAE 40	SAE 40
0° to 70° F	SAE 30	SAE 40 or 20W-30
Below 10° F	SAE 20	SAE 20W-30

All oils used must conform to Lycoming Spec. No. 301E.

b. REQUIREMENTS FOR NEW ENGINES. Your engine is filled at the factory with the proper grade of straight mineral oil. Only straight mineral oil (not additive oil) should be used for the first 50 hours or until oil consumption stabilizes.

c. CHANGING ENGINE OIL. It is recommended that engine oil be changed approximately every 30 hours. Depending on operating conditions, a longer or shorter period may be used at the discretion of the owner. To change the oil, first fly the airplane for a short period to allow oil to reach normal operating temperature. If your engine is equipped with a Handi-Drain (optional), oil is drained by pushing up on the top part of the drain hose to open the spring-loaded valve. Pull on the hose to close after draining. If your engine is not equipped with a Handi-Drain, the oil is drained by unsafetying and removing the pipe plug on the right side of the oil sump bottom. After draining, reinstall plug and secure with safety wire.

EQUIPMENT LIST AND LOADING SCHEDULE



Champion Model No. X
Serial No. 0000
Identification No. N45N
Date .....
Signed .....

	ITEM		WEIGHTS
1.	Main Wheel Weights		
2.	Tail Wheel Weight		
3.	Total Weight Empty Plus Oil		
4.	Corrected Main Wheel Wt.	(1) —1330	
5.	Corrected Tail Wheel Weight	(2) +2.05	
6.	Weight Empty (less oil)	(4) +(5)	1200
7.	Useful Load		450
8.	Gross Weight		1650

Empty Weight C.G. Aft. L.E. = (5) ( ) — = ( ) ( ) — = 12.5 IN.
( ) ( )

APPROVED EQUIPMENT LIST — EMPTY AIRPLANE MOMENT/5,000 IN. LBS.

Spec. No.	ITEM	WT.	ARM	Spec. No.	ITEM	WT.	ARM
	0-235-C1 Lycoming Inst.			404g	Parachute Seat Inst. w/		
	Dry w/starter & Gen.	246	—40		Chutes & Belts	33	45
4e	Spinner Assembly	4	—61	408	Rear Seat Heater	2	—9
1	McCauley Prop 1C90ALM72	28	—58		Turn & Bank Ind.	2	—5
102g	Carb. Air Box Assembly	1	—33		Rate of Climb Ind.	1	—4
103f	Carb. Air Filter	1	—37		Horizon Gyro	5	—6
11b	Starter Assembly	18	—46		Directional Gyro	4	—6
117f	Mixture Control Inst.	1	—10		Clock		
119	39 Gal Fuel System	32	20		O.A.T. Gage		
120d	Mufflers & Stack Inst.	15	—36				
121c	Vacuum Pump Inst.	5	—28				
201h	Hyd. Brake & Wheel Ass'y.			116	26 Gal Fuel System	24	24
	700x6, 6 Ply Tires	37	0				
202i	Maule SFS-1-2P8 Tailwheel	7	191				
202g	Scott 3200 Tailwheel	8	192				
206j	Wheel Pants	14	0				
207d	Parking Brake	2	—16				
210d	Hd. Brake Sym., Cleveland	3	—6				
305g	Position Lights	1	90				
307b	Battery Inst. 12V (Rebat)	23	—27				
308c	Gen. & Volt. Reg. 20 amp.	12	—45				
308d	Gen. & Volt. Reg. 35 amp.	18	—46				
310f	Landing Light	1	—53				
404b	Front Seat, Cushions & Belt	13	16				
404h	Rear Seat, Cushion & Belt	13	46				
404f	Parachute Seat Inst. w/						
	Chutes & Belts	33	15				

SAMPLE—Page 2 of equipment list and loading Schedule
Figure 3.

ACCELEROMETER MARKINGS—MODELS 7GCBC, 7KCAB.

Maximum (red line) .....5.2 G.
Minimum (red line) .....-2.0 G.
Normal (green arc) .....-2.0 to 5.2 G.

On all models except the 7KCAB, continuous inverted operation will cause loss of oil and oil pressure. On the Model 7KCAB, minimum oil quantity for inverted operation is 6 qts., and the inverted oil system will provide limited inverted operation without loss of oil or oil pressure.

C-7. WEIGHT AND BALANCE. Your Citabria is designed to be flown within certain limits of weight and center-of-gravity (c. g.) location. Gross weight of all models is 1650 pounds. Forward and aft c. g. limits are given on the operations limitations card furnished with your airplane. Until you become familiar with permissable loading in your airplane, and in any marginal case, you must calculate the weight and c. g. location and determine whether or not they are within the specified limits. To perform these calculations, you will need the Equipment List and Loading Schedule furnished with your airplane. This document shows 1. the aircraft empty weight and c. g. location (or moment, which equals the c. g. location times the weight), 2. moments based on the weight of passenger, pilot, etc., and 3. the center-of-gravity envelope. An Equipment List and Loading Schedule for a typical airplane are given in Figures 1, 2 and 3, pages 19 and 20. The following example of a weight-and-balance calculation is based on these figures. (When calculating the weight and balance for your airplane, use the sheets supplied with the airplane).

Let us assume that we want to do aerobatics with the airplane shown in the figures (N4500H). Assume that we will carry 1. a 160-lb. pilot, 2. a 200-lb. passenger, 3. 8 qts. of oil, and 4. 10 gals. of gasoline. Table shows the calculations necessary to check the weight and balance. The table is constructed as follows:

1. Enter the empty airplane weight and moment.

2. Enter the pilot's weight (160-lbs.).

3. Calculate and enter the pilot's moment, using the loading graph of Figure 1. Draw a horizontal line from the pilot's weight on the vertical scale to the inclined pilot's moment line. From the intersection of these two lines, draw a vertical line intersecting the horizontal scale. At this intersection with the horizontal scale, read the pilot's moment.

4. Calculate the moments of other items similarly and enter in table. Note that the oil moment will be negative, since the oil is located forward of the datum.

5. Obtain the sum of all weights and moments. Since the oil moment is negative, it must be subtracted from the sum of all other moments.

6. Using the center-of-gravity envelope of figure 2, draw a horizontal line through the total airplane weight and a vertical line through the total airplane moment. The intersection of these lines represents the loading point. Since this point is within the envelope and is not in the "aerobatics prohibited" area, the loading is satisfactory.

7. If the actual c. g. location is desired, divide the total moment by the total weight. This gives the c. g. location in inches act of datum. The datum is an imaginary vertical line drawn on a side view of the airplane through the wing leading edge.

Sample Weight and Balance Calculation

ITEM	WEIGHT	MOMENT
Airplane (empty)	1200	+15000
Pilot	160	+ 1800
Passenger	200	+ 8200
Oil	15	— 500
Fuel	60	+ 1500
TOTALS	1635	+26000

c. g. location =26000 / 1635 =15.9 in. aft datum

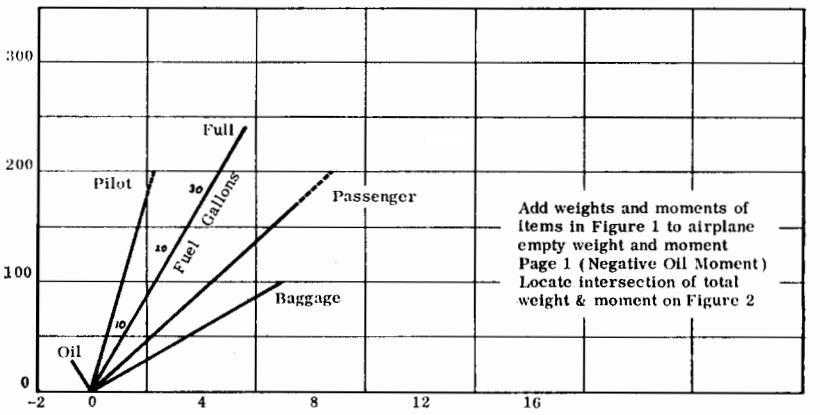


Figure 1.

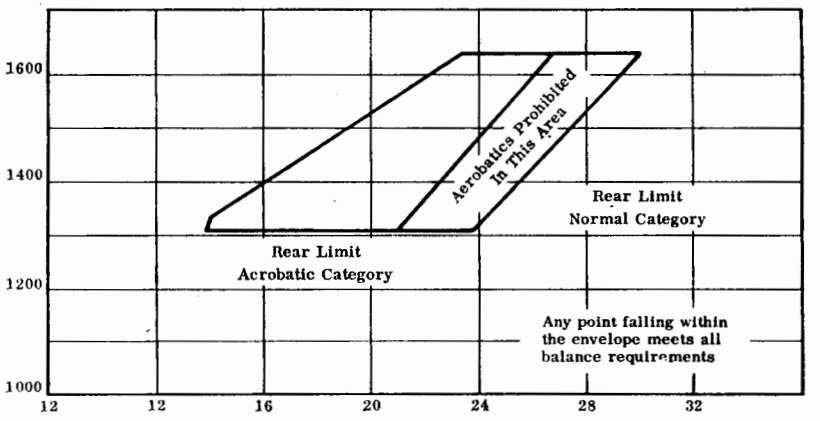


Figure 2.

SAMPLE—Page 1 of equipment list and loading schedule