

**ERCOUPE
415-C
OPERATORS
HANDBOOK**



FOR REFERENCE ONLY

Table of Contents

Critical Data	3
Weight Data	3
V Speeds	3
Preflight Inspection	4
Preflight Checklist	5
Flight Checklist	6
Shut Down Checklist	7
Weight & Balance Data	8
Emergency Checklists	9
Engine Failure During Takeoff	9
Engine Failure Immediately after takeoff	9
Engine Failure During Flight	9
Landing without Engine Power	10
Precautionary Landing with Power	10
Fire During Start on Ground	11
Engine Fire in Flight	11
Wing Fire in Flight	12
Cabin Fire in Flight	12
Electrical Fire in Flight	12
Ammeter Excessive rate of Charge or Discharge	13
Inadvertent Flight into IFR Conditions	13
Ditching	13
Inadvertent Icing	14
Engine Data	15
Engine Specifications	15
Engine Operating Limits	16
Sea Level Performance Curve	17
Altitude Performance Chart	18
Reference Section	19
METAR Reports	19
VFR Cruising Altitudes	19
VFR Weather Minimums	19
Koch Chart	20
Temperature Conversion	20
Pressure Altitude	21
Distance - Time	21
Crosswind Calculator	21



HAVE A GREAT FLIGHT!

CRITICAL DATA

MAXIMUM TAKE OFF WEIGHT1320 LBS
MAXIMUM BAGGAGE WEIGHT.....40 LBS

CRITICAL SPEEDS

Stall (V_{SO}) 48 MPH
 Maneuvering Speed (V_A)..... 108 MPH

TAKEOFF & CLIMB SPEEDS

V_R (Rotate) 60 MPH
 V_X (Best Angle of Climb)..... 69 MPH
 V_Y (Best Rate of Climb) 75 MPH

OPERATING SPEEDS

Never Exceed Speed (V_{NE}) 144 MPH
 Max Structural Cruise Speed (V_{NO}) 114 MPH
 Normal Operation Range 50-114 MPH
 Caution Range 114-144 MPH
 Max Demonstrated Crosswind 21.5 KTS

DESCENT SPEEDS

Final 75-80 MPH
 V_{GLIDE} 75 mph

FUEL CAPACITY

Header Tank 6 gal
 Wing Tank 9 gal each

PRE-FLIGHT INSPECTION

Weather / Performance Data CHECK
 Money for Fuel (X-Country)..... CHECK
 Keys ON DASHBOARD

EMPENAGE

Skins & Rivets..... UNDAMAGED
 Vertical Fins SECURE
 Rudder – Movement/Security (Outboard movement only)... CHECK
 Elevator – Movement/Security..... CHECK
 White Navigation Light..... CHECK
 Tie Down..... REMOVED

RIGHT WING

Right Aileron Security CHECK
 Right Navigation Light CHECK
 General Condition of Fabric..... CHECK
 Right Brakes and Strut CHECK
 Right Tire Pressure (17 psi)..... CHECK
 Tie Down..... REMOVED
 Right Wing Tank (Cap vent must be forward) CHECK & SUMP

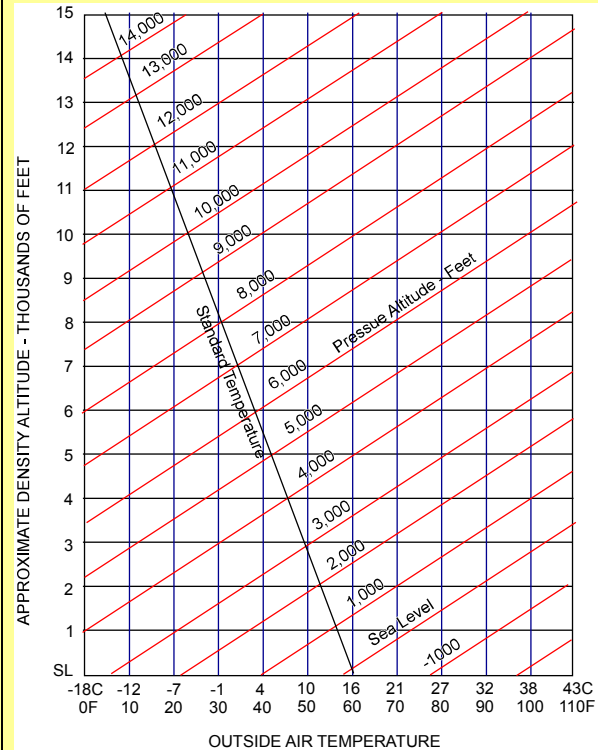
NOSE

Header Tank (Cap vent must be forward) CHECK & SUMP
 Oil Quantity (Max = 4.5 qt; Min = 2 qt) CHECK
 Right Cowling CHECK & SECURE
 Nose Tire (20 psi)..... CHECK
 Propeller & Spinner CHECK
 Strut CHECK
 Vents & Bracket Air Filter CHECK
 Gascolator CHECK & SUMP
 Left Cowling CHECK & SECURE

LEFT WING

Left Wing Tank (Vent in cap must be forward) CHECK & SUMP
 Left Brakes and Strut CHECK
 Left Tire Pressure (17 psi)..... CHECK
 Pitot Cover..... REMOVED
 Tie Down..... REMOVED
 Left Navigation Light..... CHECK
 Left Aileron Security CHECK
 General Condition of Fabric..... CHECK
 One Last 360° Walkaround COMPLETE

✈️ PRESSURE ALTITUDE



✈️ Distance-Time

Spd	Distance			
	5	10	15	20
70	4:17	8:34	12:51	17:09
80	3:45	7:30	11:15	15:00
90	3:20	6:40	10:00	13:20
100	3:00	6:00	9:00	12:00
110	2:43	5:27	8:10	10:54
120	2:30	5:00	7:30	10:00

✈️ CONVERSIONS

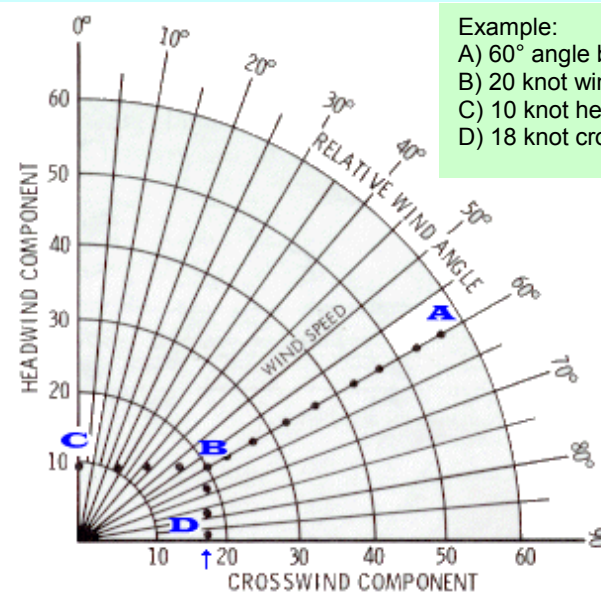
DISTANCE Multiplier
 SM to Nautical Miles .869
 Nautical Miles to SM 1.610

SPEED:
 Knots to MPH 1.151
 MPH to Knots 1.609

TIME:
 Eastern: -5:00
 Central: -6:00
 Mountain -7:00
 Pacific -8:00
 London GMT (Z)

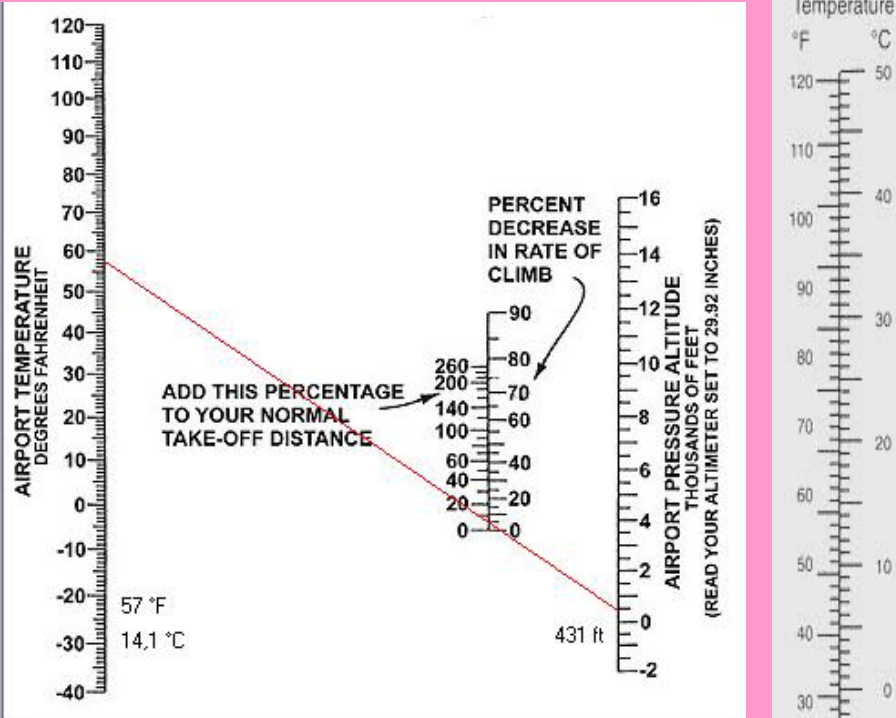
Avgas 6 lbs/gal
Oil 1.875 lbs/qt
Water 8.35 lbs/gal

✈️ CROSSWIND CALCULATION

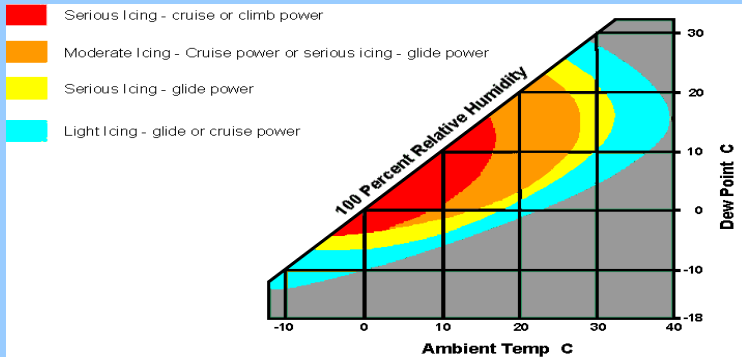


Example:
 A) 60° angle between wind and nose
 B) 20 knot wind speed
 C) 10 knot headwind component
 D) 18 knot crosswind component

KOCH CHART



CARBURETOR ICE REFERENCE CHART



Light Signal

	Ground	Flight
Green (steady)	Cleared for Takeoff	Cleared to Land
Green (flashing)	Cleared to Taxi	Return for Landing
Red (steady)	STOP	Give way to others
Red (flashing)	Taxi clear of runway	Airport UNSAFE
White (flashing)	Return to starting point	N/A
Alt. Red/Green	CAUTION	CAUTION

PRE-FLIGHT CHECKLIST

BEFORE START

Pre-flight Inspection.....	COMPLETE
Airworthiness Certificate.....	CHECK
Registration	CHECK
Weight & Balance.....	CHECK
Passenger Brief.....	COMPLETE
Seat Belts	SECURE
Baggage Compartment	SECURE
Fuel Cross Feed.....	BOTH
Fuel Valve.....	ON
Radios, Intercom, & Panel Lights.....	OFF
Headsets	CHECK
Circuit Breakers.....	CHECK
Brakes	SET
Strobe Light.....	ON
Carb Heat.....	OFF / COLD
Key	IN IGNITION SWITCH
MASTER.....	ON

COLD ENGINE

Primer.....	2 – 6 Strokes
Primer.....	LOCKED
Throttle	OPEN ¼ INCH

ENGINE START

Magnetos.....	ON (BOTH)
Propeller Area	CLEAR
Starter.....	PULL
Oil Pressure.....	CHECK (10 PSI MIN)
Transponder	STBY
Intercom.....	ON
Navigation Lights.....	ON

TAXI

ATIS.....	LISTEN & RECORD
Traffic.....	LOOK & LISTEN
Taxi Clearance	OBTAINED
Brakes	CHECK
Compass	CHECK

FLIGHT CHECKLIST

BEFORE TAKEOFF

Brake ON
 Controls (Elevator Only) FREE
 Throttle 1700 RPM
 Ignition Check (Max drop 150 RPM, 75 RPM Difference).... CHECK
 Carb Heat (Verify drop and stable)..... CHECK
 Oil Pressure 30 PSI (MIN)
 Oil Temperature 100° (MIN)
 Throttle 1000 RPM
 Altimeter and Radio SET
 Transponder ALT
 Elevator Trim SET
 Traffic CHECK

TAKEOFF

Carb Heat COLD (IN)
 Throttle FULL OPEN
 Elevator Lift Nose Wheel at 60 MPH
 Climb 70-80 MPH

CRUISE

Throttle SET (2120 – 2300 RPM)
 Oil Pressure 30 -40 PSI
 Elevator TRIM

LANDING

Carb Heat FULL HEAT (OUT) before closing throttle
 Best Glide 75 MPH
 Approach 75 MPH (power) - 80 MPH (no power)

GO AROUND

Carb Heat COLD (IN)
 Throttle FULL
 Elevator Lift Nose Wheel at 60 MPH
 Climb 70-80 MPH

AFTER LANDING

Carb Heat COLD (IN)

✈ METAR Reports

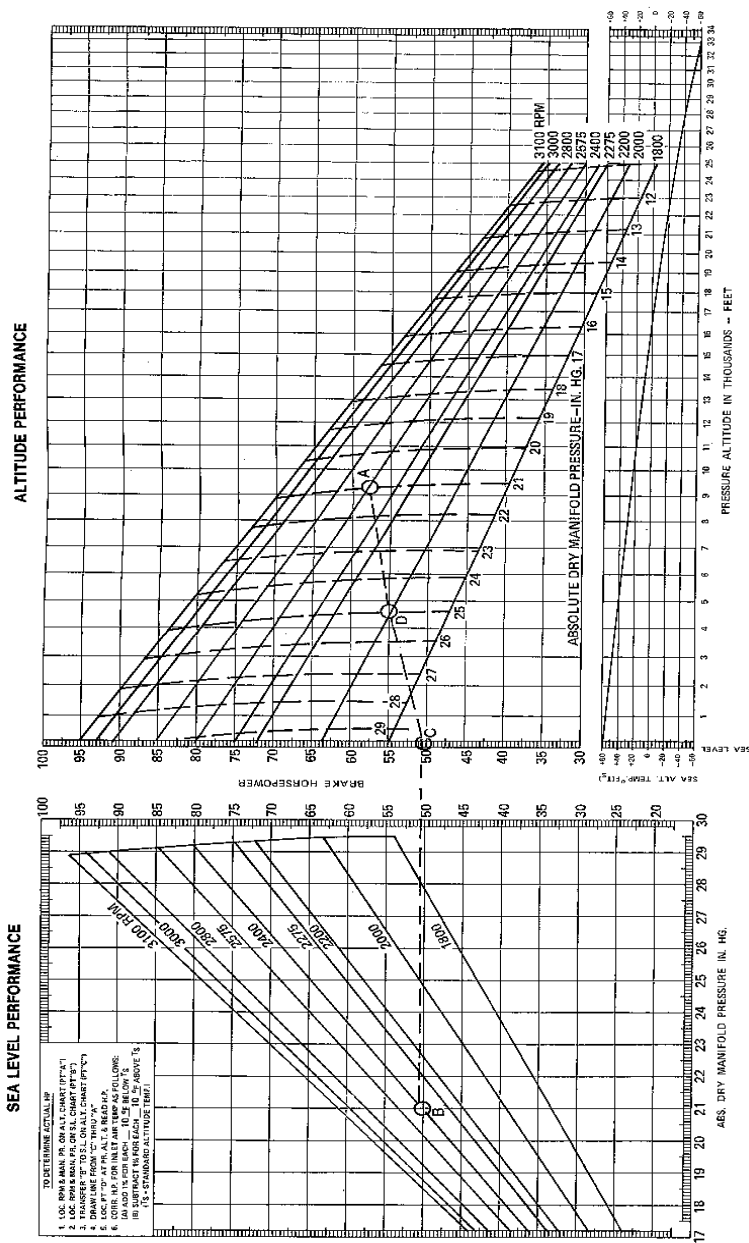
Item	Description	Sample	Codes
Message Type	METAR (hourly), TAF	METAR	
Location		KCRQ	BC Patches
Issuance Time	DDTTT (Zulu)	091955Z	BL Blowing
Observation	COR rected or AUT omatic	COR	BR Mist
Wind	direction VAR , speed, Gust	22015G25KT	CB Cumulonimbus
Visibility	Statute Miles	4SM	DR Low Drifting
Runway Vis Range	R , runway / range	R28L/2600FT	DS Dust Storm
Significant Weather	See Chart	TSRA	DU Dust
Cloud Cover	Amount, height and Type	OVC010CB	DZ Drizzle
Temp/Dewpoint	M for below zero	18 / 16	+FX Tornado
Altimeter Setting	A for inches and Hundredths	A2992	FC Funnel Cloud
Remarks	Sea-level press. In tenths hPa	RMK SLP045	FG Fog
	Temp/dewpoint in tenths iC	T01820159	FU Smoke
			FZ Freezing
			GR Hail
			GS Hail/Snow Pellets
			HZ Haze
			IC Ice Crystals
			MI Shallow
			PE Ice Pellets
			PO Dust/Sand Whirls
			PR Partial
			PY Spray
			RA Rain
			-RA Light Rain
			SA Sand
			SG Snow Grains
			SH Showers
			SN Snow
			+SN Heavy Snow
			SQ Squall
			SS Sand Storm
			TCU Towering CB
			TS Thunderstorms
			UP Unknown Precip.
			VA Volcanic Ash

✈ VFR CRUISING ALTITUDES

✈ VFR WEATHER MINIMUMS

Class	Altitude	Vis (sm)	Cloud Distance		
			above	below	lateral
A	All	X	No VFR Allowed		
B	All	3	Clear of Clouds		
C	All	3	1000	500	2000
D	All	3	1000	500	2000
E	<10,000 MSL	3	1000	500	2000
E	>=10,000 MSL	3	1000	1000	1 sm
G Day	<=1,200 AGL	1	Clear of Clouds		
G Day	>1,200 AGL – 10,000 MSL	1	1000	500	2000
G Nite	<=1,200 AGL	3	1000	500	2000
G Nite	1,200SGL – 10,000 MSL	3	1000	500	2000
G	>1200 AGL & 10,000 MSL	5	1000	1000	1 sm

Model C75 & C85 – Altitude Performance Curve



SHUT DOWN CHECKLIST

SHUT DOWN

- Lights OFF
- Transponder OFF
- Radios CHECK 121.5
- Radios OFF
- Header Tank Fuel Valve OFF
- Magnetos OFF
- Master Switch OFF
- Keys ON DASH

SECURE AIRPLANE

- Pitot Cover INSTALLED
- Tie Downs SECURE
- Skin WIPE DOWN
- Nose Gear Strut WIPE w/OIL
- Windows CLOSED & LOCKED
- Cover INSTALLED

Phone Numbers

- Flight Service 1-800-WX-BRIEF (1-800-992-7433)

Weight & Balance Data

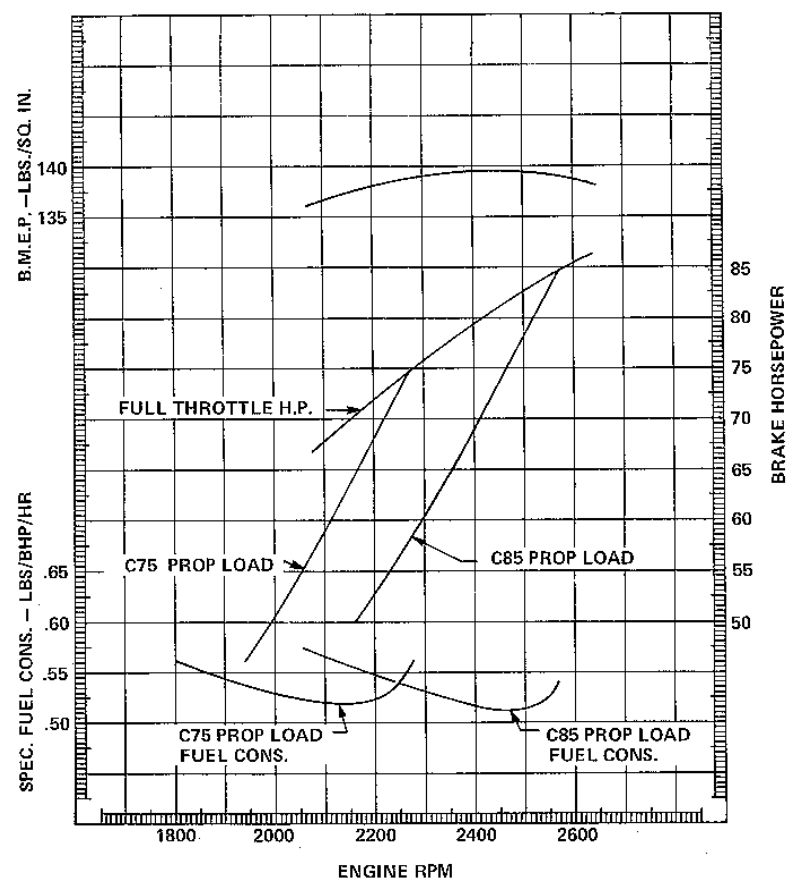
Item	Weight	Arm	Moment
Empty Airplane	888	26.376	23422
Equipment List			
ELT			
Radio (icom IA200)			
Xponder			
Blind Encoder			

Day to Day Operations	Qty	Fill in white spaces & calculate	
Fuel -Header tank (gal)			7
Fuel -Wing tanks (gal)			25
Usable Oil (4.5 quarts)		8.3	-14 -103.6
Pilot			37
Passenger			37
Baggage			62
Totals			
Center of Gravity (CG)			
CG Range		26.4" to 30.3"	

Formulas: Weight x Arm= Moment; \sum Moments/ \sum Weight = CG

Power Setting		65%	75%	100%
Fuel Rate	gph	3.6	4.1	5.5
Reserve (30 min)	gal	1.8	2.1	2.8
Tot. Flying Time w/res.	hrs	2.86	2.41	1.68
Flying Time NO res.	hrs	3.36	2.91	2.18
Indicated Airspeed	mph	96.0	108.0	120
Range w/reserves	(mi)	274.2	260.2	201.8
Range NO reserves	(mi)	322.2	314.2	261.8

Operating Limits	Difference
415-C (max Gross)	1320 lbs

Model C75 & C85 – Sea Level Performance Curve

OPERATING LIMITS – C 85

OPERATION	MAX. CONTINUOUS HORSEPOWER	MAX. RECM. CLIMB	MAX. RECM. CRUISE	RECM. CRUISE	ECONOMY CRUISE	RUN UP
%NRP	100	75	75	65	55	-
BHP (SEA LEVEL)	85	64	64	55	47	-
RPM	2575	2340	2340	2230	2120	800
FUEL FLOW (PPH)	SEE FUEL FLOW CURVE					
CYLINDER HEAD TEMPERATURE (F°)						
MINIMUM	240	240	240	240	240	200
NORMAL	360-420	300-400	300-400	300-380	300-350	200-400
MAXIMUM	540	540	540	540	540	540
OIL TEMPERATURE (F°)						
MINIMUM	100	100	100	100	100	75
NORMAL	150-200	150-180	150-180	150-180	150-180	75-180
MAXIMUM	225	225	225	225	225	225
OIL PRESSURE (PSI)						
MINIMUM - IDLE	10	10	10	10	10	10
NORMAL	30-35	30-35	30-35	30-35	30-35	30-35
MAXIMUM	35	35	35	35	35	100**

**With Cold Oil Only.

EMERGENCY CHECKLIST

Best Glide Speed 78 MPH

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle IDLE
2. Brakes APPLY
3. Ignition Switch OFF
4. Master Switch OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

5. Airspeed 78 MPH
6. Main Fuel Selector Valve OFF (FWD)
7. Fuel Transfer Valve OFF
8. Ignition Switch OFF
9. Master Switch OFF
10. Canopy DO NOT OPEN

ENGINE FAILURE DURING FLIGHT

1. Airspeed 78 MPH
2. Carb Heat FULL ON (Pull)
3. Main Fuel Selector Valve VERIFY ON
4. Fuel Transfer Valve VERIFY ON
5. Ignition Switch BOTH
6. Primer IN & LOCKED
7. Starter Button PULL (If Prop is Stopped)
8. Radio 121.5 - MAYDAY & POSITION
9. Transponder SQUAWK 7700
10. ELT Activate

EMERGENCY CHECKLIST

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Airspeed 78 MPH
2. Main Fuel Selector Valve OFF (FWD)
3. Fuel Transfer Valve OFF
4. Ignition Switch OFF
5. Master Switch OFF
6. Seat Belts SECURE
7. Passenger BRIEF (No Feet on Control Mast)
8. Canopy DO NOT OPEN
9. Touchdown SLIGHTLY TAIL LOW
10. Brakes APPLY HEAVY

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Airspeed 80 MPH
2. Seat Belts CHECK
3. Passenger BRIEF (No Feet on Control Mast)
4. Selected Field
FLY OVER, INSPECT, CK WIND DIR.
5. Radio 121.5 - MAYDAY & POSITION
6. Master Switch OFF
7. Canopy UNLATCH - DO NOT OPEN
8. Carb Heat FULL ON
9. Approach Speed 78 MPH UNTIL SHORT FINAL
10. Touchdown SLIGHTLY TAIL LOW
11. Ignition Switch OFF
12. Brakes APPLY HEAVILY

✈ Engine Specifications for C85

Type Certificate No.....	233
Bore (inches).....	4 - 1/16
Stroke (inches).....	3 - 5/8
Comp. Ratio.....	6.3:1
Piston Disp. (cu. In.).....	188
Rated Power (sea Level).....	85
Rated RPM.....	2575
Max Allowed Press. (in Hg.) at rated RPM at Sea Level.....	29
Recommended Cruising RPM.....	2400
Max. Rec. Manifold Pressure (in Hg.) for cruising at SL.....	24.5
Minimum Fuel Grade.....	80/87
Oil Pressure at Cruising (psi).....	30-35
Min. Idling Oil Pressure (psi).....	10
Minimum Oil Temperature - F°.....	75
Maximum Oil Temperature - F°.....	225
Max. Cylinder Head Temperature - F°.....	540
Approx. Fuel consumption in Gals./Hour Cruising.....	5.4
Approx Max. Desirable Oil Consumption in Qts/hr.....	4
Oil Sump Capacity in Qts.....	4.5
Tappet Clearance:	
Operating.....	0
Lifters Deflated.....	.030-.110
Ignition Timing BTC	
Right.....	28°
Left.....	30°

EMERGENCY CHECKLIST

INADVERTENT ICING ENCOUNTER

1. Airplane TURN BACK / CHANGE ALTITUDE
to attain an OAT less conducive to icing.
2. Cabin Heat FULL ON
3. Throttle OPEN to increase engine speed and
minimize ice buildup on propeller blades.
4. Carb Heat WATCH for loss of power and
APPLY as required
5. Landing LAND as soon as practical
If rapid ice build-up, land off airport
6. Stall Speed Expect Higher Stall Speed
7. Canopy OPEN if required for visibility
for landing approach
SCRAPE windshield, if practical
8. Landing Perform using forward slip
if required for visibility.
9. Approach 85 to 90 MPH depending
on amount of ice accumulation
10. Land LEVEL ATTITUDE
Expect higher stall speed.

EMERGENCY CHECKLIST

FIRE DURING START ON GROUND

1. Cranking CONTINUE to get a start
- If Engine Starts:**
2. Power 1700 RPM for 2 MINUTES
 3. Engine SHUTDOWN AND INSPECT
- If Engine Won't Start:**
4. Cranking STOP Cranking
 5. Passenger EXIT to REAR of Airplane
 6. Throttle FULL OPEN
 7. Master Switch OFF
 8. Ignition Switch OFF
 9. Main Fuel Valve OFF (Handle to Right)
 10. Fuel Transfer Valve OFF
 11. Fire EXTINGUISH with Extinguisher
 12. Fire Damage INSPECT

ENGINE FIRE IN FLIGHT

1. Main Fuel Valve OFF
2. Fuel Transfer Valve OFF
3. Master Switch OFF
4. Cabin Heat Knob OFF (PUSH IN)
5. Cabin Air Knob OFF (PUSH IN)
6. Airspeed 115 MPH
If **not** extinguished Increase glide speed
7. Engine DO NOT ATTEMPT RESTART
8. Forced Landing EXECUTE Emergency Landing
Without Power

EMERGENCY CHECKLIST

WING FIRE IN FLIGHT

1. Navigation Light Switch.....OFF
2. Airplane SIDESLIP to keep flames away from fuel tank and cabin
3. Flight LAND as soon as practical

CABIN FIRE IN FLIGHT

1. Master Switch.....OFF
2. All Vents, Cabin Heat, AirOFF / CLOSED
3. Fire Extinguisher ACTIVATE
4. Cabin VENTILATE AFTER fire is out.
5. Flight LAND as soon as practical.

ELECTRICAL FIRE IN FLIGHT

1. Master Switch.....OFF
2. All Switches Except IgnitionOFF
3. All Vents, Cabin Heat, AirOFF / CLOSED
4. Fire Extinguisher ACTIVATE
5. Cabin VENTILATE as required to clear extinguishing agent
6. If Fire is out and electrical power is REQUIRED for continuance of flight:
7. Radio SwitchesOFF
8. Master Switch..... ON
9. Circuit Breakers.....CHECK for faulty circuit
DO NOT RESET
10. Radio/Electrical Switches, IF REQUIRED: ON
One at a time with delay after each, until short circuit is localized
11. Vents/Cabin Air/Heat..... OPEN when it is ascertained that fire is completely extinguished
12. Flight LAND as soon as practical

EMERGENCY CHECKLIST

AMMETER SHOWS EXCESSIVE HIGH RATE OF CHARGE OR DISCHARGE

1. Generator SwitchOFF
2. Non-Essential SwitchesOFF
3. If Abnormal Condition Not Corrected:
4. Master SwitchOFF
5. Flight LAND as soon as practical.

INADVERTENT FLIGHT INTO IFR CONDITIONS

1. Power 2200 RPM
2. Direction Note Heading
3. Flight Execute Standard Rate 180 turn

DITCHING

1. Radio 121.5 - MAYDAY & POSITION
2. Transponder..... SQUAWK 7700
3. Heavy Objects..... SECURE OR JETTISON
4. Approach.....
High Winds, Heavy Seas - INTO THE WIND
Light Winds, Heavy Swells - PARALLEL TO SWELLS
5. Power 300 FPM DESCENT AT 55 MPH
6. If NO POWER APPROACH AT 75 MPH
7. Canopy OPEN
8. Touchdown LEVEL ATTITUDE
At Established rate of decent
8. Face CUSHION at touchdown with folded coat
9. Airplane EVACUATE IMMEDIATELY
10. Life Vests INFLATE