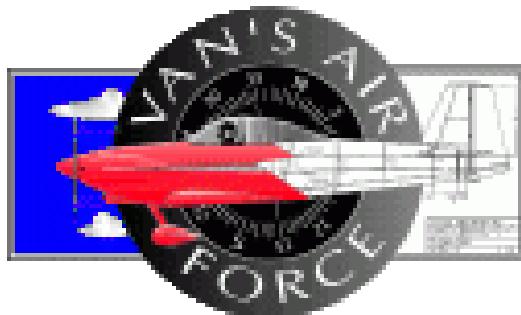


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Van's Aircraft RV-7

Pilot's Operating Handbook

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PERFORMANCE – SPECIFICATIONS

SPAN:	25' 0"
LENGTH:	20' 4"
HEIGHT:	7' 10"
SPEED:	
Maximum at Sea Level	180 NM/hr
Cruise, 75% Power at 8,000 Ft	171 NM/hr
RANGE (includes 3 gal. for taxi, takeoff & climb):	
75% @ 8000', no reserve	608 NM
55% @ 8000' no reserve	765 NM
75% @ 8000', one hour (10 gal) reserve	434 NM
55% @ 8000', one hour (10 gal) reserve	590 NM
RATE OF CLIMB AT SEA LEVEL	1,600 FPM
SERVICE CEILING	19,500 FT
TAKEOFF PERFORMANCE:	575 Ft
LANDING PERFORMANCE:	500 Ft
STALL SPEED (CAS):	
Flaps Up, Power Off	54 NM/hr
Flaps Down, Power Off	50 NM/hr
MAXIMUM WEIGHT (Normal Category):	1800 Lbs
EMPTY WEIGHT	1030 Lbs
MAXIMUM USEFUL LOAD:	770 Lbs
BAGGAGE ALLOWANCE	100 Lbs
WING LOADING (Pounds/ Sq. Ft)	14.8 Lbs
POWER LOADING (Pounds/ HP)	10 Lbs
FUEL:	
Capacity	42 Gal Total
Type	100 LL
OIL CAPACITY	8 Qts
ENGINE: Lycoming	YIO-360-M1B
PROPELLER: Whirlwind	200RV

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AIRSPEED LIMITATIONS

	SPEED	IAS	REMARKS
V_{NE}	Never Exceed Speed	200 NM/hr	Do not exceed this speed in any operations.
V_{NO}	Maximum Structural Cruising Speed	168 NM/hr	Exceed this speed only in smooth air.
V_A	Maneuvering Speed	123 NM/hr	Do not make full control movements above this speed. Full elevator deflection will result in a 6g load at this speed.
V_{FE}	Maximum Flap Extended Speed	96 –20deg 87 - Full	Do not exceed this speed with flaps down
V_y	Best Rate of Climb	96 NM/hr	
V_x	Best Angle of Climb	70 NM/hr	
V_s	Stall Speed Clean	56 NM/hr	
V_{so}	Stall Speed Landing Configuration	50 NM/hr	

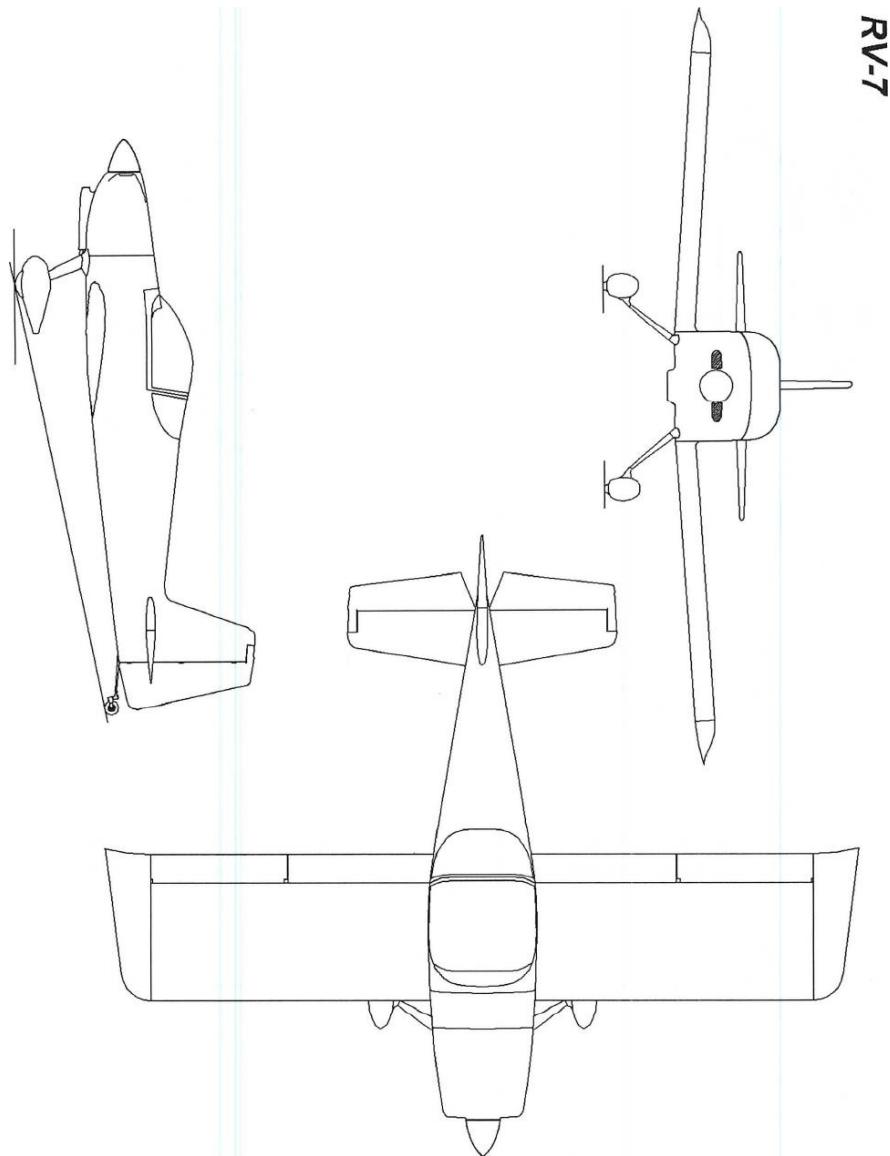
AIRSPEED INDICATOR MARKINGS

MARKING	IAS VALUE OR RANGE	SIGNIFICANCE
White Arc	50-87 NM/hr	Full Flap Operating Range. Lower limit is V _{so} . Upper limit is maximum speed with flaps extended
Green Arc	56-168 NM/hr	Normal Operating Range. Lower limit is V _s . Upper limit is maximum structural cruising speed
Yellow Arc	168-200 NM/hr	Operations must be conducted with caution and only in smooth air.
Red Line	200 NM/hr	Maximum speed for all operations

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Views



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AEROBATIC INFORMATION

Weight Limitation – 1600 Pounds

Recommended Entry Speeds:

Loops, Horizontal Eights	122-165 nm/h
Immelman Turns	130-165 nm/h
Aileron Rolls, Barrel Rolls	104-165 nm/h
Snap Rolls	70-96 nm/h
Vertical Rolls	156-165 nm/h
Split-S	87-96 nm/h



PREFLIGHT INSPECTION

1. CABIN

- a) Documentation -- Available In Airplane
- b) Aeronautical Charts – CURRENT AND APPROPRIATE TO FLIGHT
- c) Seat Belt Securing Control Stick -- RELEASE
- d) Ignition Switch -- OFF
- e) Avionics -- OFF
- f) Master Switch -- ON
- g) EFIS – ON
- h) Fuel Quantity -- CHECK QUANTITY
- i) Flaps – DOWN
- j) EFIS - OFF
- k) Master Switch -- OFF

2. EMPENNAGE

- a) Tail Tie-Down – DISCONNECT
- b) Tail Wheel – CHECK condition and security
- c) Control Surfaces -- CHECK freedom of movement and security
- d) Static Sources (both sides of fuselage) –CHECK for blockage
- e) Tail and Strobe--CHECK condition

3. RIGHT WING

- a) Aileron -- CHECK freedom of movement and security
- b) Flap -- CHECK security
- c) Nav and Strobe--CHECK condition
- d) Right Landing Light -- CHECK condition
- e) Wing Tie-Down -- DISCONNECT
- f) Main Wheel Tire -- CHECK for proper inflation
- g) Chock -- REMOVE
- h) Right Wing Tank – SUMP
- i) Fuel Quantity -- CHECK VISUALLY
- j) Fuel Filler Cap – SECURE

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5. NOSE

- a) Engine Oil Level -- CHECK, do not operate with less than 4 quarts
- b) Propeller and Spinner -- CHECK for nicks and security
- c) Cowl Hinge Pins -- CHECK for security
- d) Air Inlet -- REMOVE COVER CHECK for restrictions
- k) Fuel Tank Vents -- CHECK for blockage

6. LEFT WING

- a) Wing Tie-Down -- DISCONNECT
- b) Main Wheel Tire -- CHECK for proper inflation
- c) Chock -- REMOVE
- d) Left Wing Tank -- SUMP
- e) Fuel Quantity -- CHECK VISUALLY
- f) Fuel Filler Cap -- SECURE
- g) Pitot Tube Cover -- REMOVE and check for blockage
- h) Left Landing Light -- CHECK condition
- i) Nav and Strobe--CHECK Condition
- j) Aileron -- CHECK freedom of movement and security
- k) Flap -- CHECK security



BEFORE STARTING ENGINE

- a) Preflight Inspection -- COMPLETE
- b) Seat Belts and Shoulder Harnesses -- ADJUST and LOCK
- c) Fuel Selector Valve -- DESIRED TANK
- d) Avionics and Electrical -- OFF
- e) Brakes -- SET
- f) Circuit Breakers -- CHECK IN
- g) Canopy adjust

STARTING ENGINE (cold)

- a) Mixture – Full Rich
- b) Master Switch – ON
- c) EFIS - ON
- d) Fuel Boost Pump – ON observe pressure then OFF
- e) Throttle – Open $\frac{1}{4}$ "
- f) Prop -- HIGH RPM
- g) Flaps -- UP
- h) Propeller Area -- CLEAR
- i) Ignition Switch -- START
- j) Avionics & Instruments – ON
- k) Alternator - ON
- l) Oil Pressure -- CHECK 25 psi at idle
- m) Nav & Strobe – ON

STARTING ENGINE (Warm)

- n) Mixture – Full Rich
- o) Throttle to 1/8
- p) Prop -- HIGH RPM
- q) Master Switch – ON
- r) EFIS – ON
- s) Flaps -- UP
- t) Propeller Area -- CLEAR
- u) Ignition Switch – START
- v) Avionics & Instruments -- ON
- w) Alternator - ON
- x) Oil Pressure -- CHECK 25 psi at idle
- y) Nav & Strobe – ON

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BEFORE TAKEOFF

- a) Brakes -- SET
- b) Canopy ----- Main Latch – SECURE
- c) Flight Controls -- FREE and CORRECT
- d) Flight Instruments – SET
 - Altimeter – CORRECT PRESSURE
 - GPS-- ON
- e) Fuel Selector Valve -- DESIRED TANK
- f) Mixture -- RICH (below 3000')
- g) Elevator and Aileron Trim -- NEUTRAL
- h) Throttle -- 1700 RPM
 - 1) Magnetos -- CHECK (125 max drop, 50 diff. max)
 - 2) Prop – cycle 2 times CHECK operation
 - 3) Engine Instruments -- CHECK
 - 4) Throttle -- IDLE
- i) Radios -- SET
- j) Fuel Boost Pump -- ON
- k) Transponder – ALTITUDE
- l) Passenger – READY and willing

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TAKEOFF

NORMAL TAKEOFF

- a) Wing Flaps – UP
- b) Prop – HIGH RPM
- c) Throttle -- FULL OPEN
- d) Elevator Control – LIFT TAIL WHEEL (at 56 NM/H)
- e) Climb Speed -- 109 NM/H

SHORT FIELD TAKEOFF

- a) Wing Flaps – 10 Deg
- b) Prop – HIGH RPM
- c) Brakes – APPLY
- d) Throttle – FULL OPEN
- e) Mixture – RICH (above 3000' lean to obtain max RPM)
- f) Brakes – RELEASE
- g) Climb Speed – 78 NM/H (Vy)

ENROUTE CLIMB

- a) Airspeed – 109-130 NM/H
- b) Throttle – 25 in Hg, or full throttle
- c) Prop – 2500 RPM
- d) Boost Pump – OFF at 1000 feet AGL
- e) Fuel Pressure – CHECK
- f) Mixture – LEAN above 5000'

CRUISE

- a) Throttle – 23 in Hg
- b) Prop – 2300 RPM
- c) Trim – ADJUST
- d) Mixture – LEAN to 100 deg F rich of peak

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LANDING

- a) Approach speed 78 NM/H
- b) Flaps 20 deg.
- c) Prop control full rpm
- d) Engine 1800 rpm
- e) 70 NM/H final
- f) 40 deg. flaps

AFTER LANDING

- a) Wing Flaps – UP
- b) Boost Pump – OFF
- c) Transponder – STANDBY

ENGINE SHUTDOWN

- a) Flaps – DOWN
- b) Prop – FULL FORWARD
- c) Throttle – IDLE
- d) CHT decidedly dropped
- e) All electrical sw – OFF
- f) Mixture – IDLE CUT-OFF
- g) Wait for shut down
- h) Master – OFF

SECURING AIRCRAFT

- a) Wheel Chocks
- b) Wing & Tail Tie-Down
- c) Pitot Tube Cover
- d) Cockpit
- e) Ignition Key – REMOVED
- f) Master and Electrical Switches – OFF
- g) Canopy Locked

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Performance

Cruise Performance at 8,000':

NM/H	RPM	MAP	Fuel Flow	% Power
171	2450	23"	10.5 GPH	75%
163	2350	22"	9.5 GPH	65%
154	2250	21"	8.5 GPH	55%

No Wind Range at 8,000':

- * All range calculations include 3 gal. for engine start, taxi, takeoff and climb.
- * Engine is leaned for best economy.

One hour (10.5 gal.) reserve:

75% Power	435 NM
65% Power	513 NM
55% Power	591 NM

No Reserve:

75% Power	608 NM
65% Power	686 NM
55% Power	765 NM

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WEIGHT AND BALANCE DATA

Make: Richard A Reno

Model: RV-7

Serial: 70966

Registration: N77XV

Maximum Weights:

Aerobic Category	1600 Lbs
Utility Category	1700 Lbs
Normal Category	1800 Lbs

Datum= 70 inches forward of wing leading edge (L.E.)

Design C.G. Range = 15% to 29% of wing chord

8.7" to 16.82" from L.E.

78.7" to 86.82" aft of Datum

Wing L.E. = 70 inches aft of datum

Main wheel right = 68.45" aft of datum

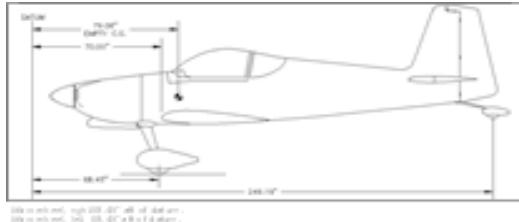
Main wheel left = 68.45" aft of datum

Tail wheel = 249.19" aft of datum

Fuel 80" aft of datum

Pilot and Passenger 97.48" aft of datum

Baggage 126.78" aft of datum



Aircraft weighed empty in level flight attitude.

(Includes 8 qts. of oil, no fuel)

Sample:

	Weight	Arm	Moment
Aircraft	<u>1030</u>		<u>83697.52</u>
Fuel (6lbs/gal)	<u>252</u>	<u>80</u>	<u>20,160</u>
Pilot	<u>185</u>	<u>97.48</u>	<u>18,033.80</u>
Passenger	<u>170</u>	<u>97.48</u>	<u>16,571.60</u>
Baggage	<u>76</u>	<u>126.78</u>	<u>9,635.28</u>
Total	<u>1713</u>		<u>148098.2</u>

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CG = Total Moment / Total Weight

CG = 86.45 in. aft of datum

CG Range = 78.7 to 86.82 inches aft of datum

Empty CG = 81.25 Empty Weight = 1030 lbs.

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WEIGHT AND BALANCE DATA

*All CG ranges for possible flight conditions
are within design limits

Weight	Left Main	Rt. Main	Tail	Total	
	477	480	73	1030	
Component	Weight	*	Arm	=	Moment
Lmain	477		68.45		32856.00
Rmain	480		68.45		32650.65
Rear	73		249.19		18190.89
sub total	1030				83697.52

CG Range 78.7 – 86.82 in aft of datum
Empty C.G. 81.25

Max. Gross Weight				Full Baggage, No Pax			
Item	Weight	Arm	Moment	Item	Weight	Arm	Moment
Aircraft	1,030		83697.52	Fuel (6 lbs/gal)	252	80	20,160
Fuel (6 lbs/gal)	252	80	20,160	Pilot	210	97.48	20470.8
Pilot	210	97.48	20470.8	Passenger	0	97.48	0
Passenger	210	97.48	20470.8	Baggage	100	126.78	12,678
Baggage	98	126.78	12424.44	Total	1592		137006.32
Total	1,800		157223.56	CG:	86.05		
CG:	87.34			Zero Fuel CG	85.00		
Zero Fuel CG	86.56						
Pilot, Pax, No Baggage				Pilot, No Pax, No Baggage			
Item	Weight	Arm	Moment	Item	Weight	Arm	Moment
Aircraft	1030		83697.52	Aircraft	1030		83697.52
Fuel (6 lbs/gal)	252	80	21,160	Fuel (6 lbs/gal)	252	80	21,160
Pilot	210	97.48	20470.8	Pilot	210	97.48	20470.8
Passenger	210	97.48	20470.8	Passenger	0	97.48	0
Baggage				Baggage			126.78
Total	1702		146569.1	Total	1,492		126098.3
CG:	86.12			CG:	84.52		
Zero Fuel CG	86.35			Zero Fuel CG	84.51		

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Engine Information

Model: Lycoming YIO-360-M1B, Fuel Injected
HP: 180
Fuel: 91/96 or 100/130 octane minimum
..... 100LL
Oil Filter: Champion CH48110

OIL: Avg Ambiant Air	MIL-L-6082 Grades	Ashless Dispersant Grades
Above 80F	SAE 60	SAE 60,20w50
Above 60F	SAE 60	SAE 60
30 – 90F	SAE 40	SAE 40,50
0-70F	SAE 30	SAE 30,40 or SAE 40
Below 10F	SAE 20	SAE 30 or 20w30

Oil Sump Capacity 8 U.S. Quarts

Minimum Safe Quantity ...2 U.S. Quarts

Operating Conditions:

Oil Inlet Temp: 82 deg C desired, 118 deg C Maximum

Oil Pressure: 95 psi max; 55 psi min; 25 psi idle

Fuel Pressure: ? psi max; ? psi min; ? psi desired

Cyl. Head Temp 66 deg C – 205 deg C desired range, 260 deg C max

Max oil consumption .45qts/hr. at cruise

Conversion table:

Celc. Fahr. Celc. Fahr. Celc. Fahr. Celc. Fahr. Celc. Fahr.

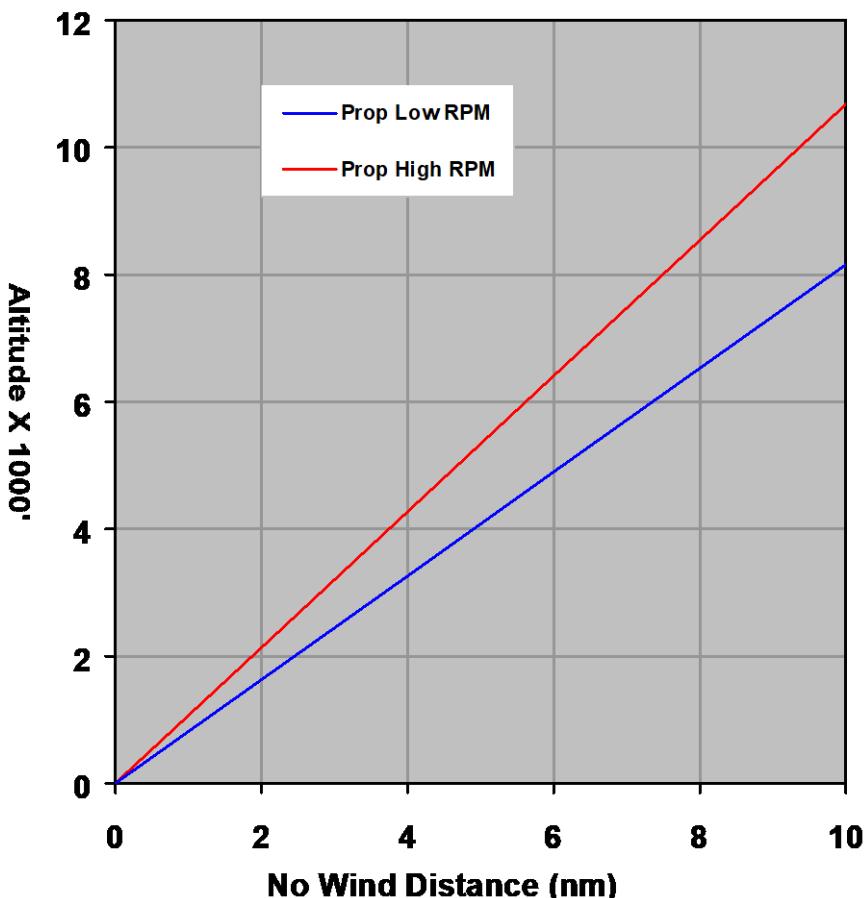
10	50	60	140	110	230	160	320	210	410
16	60	66	150	116	240	166	330	216	420
21	70	71	160	121	250	171	340	221	430
27	80	77	170	127	260	177	350	227	440
32	90	82	180	132	270	182	360	232	450
38	100	88	190	138	280	188	370	238	460
43	110	93	200	143	290	193	380	243	470
49	120	99	210	149	300	199	390	249	480
54	130	104	220	154	310	204	400	254	490

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Engine Out Glide Performance

Airspeed 75 Kts



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EMERGENCY PROCEDURES

AIRSPEEDS FOR EMERGENCY OPERATIONS

Engine Failure After Takeoff:

Wing Flaps Up	78 Nm/hr
Wing Flaps Down	70 Nm/hr

Maneuvering Speed (Va) 113 Nm/hr

Maximum Glide 78 Nm/hr

ELECTRICAL / ALTERNATOR FAILURE

1. Avionics -OFF
2. Master Switch – OFF
3. Alt Field -- OFF
4. Master Switch – ON

IF ALTERNATOR IS STILL OFF-LINE:

5. Master Switch – ON
6. Electrical Switches – OFF
7. Alternator Field – OFF
8. Avionics – ON as required
9. Electrical Equipment – ON, as required
10. Flight – TERMINATE as soon as practical, aircraft is on battery reserves only.

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EMERGENCY PROCEDURES

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle –IDLE
2. Brakes – APPLY
3. Wing Flaps – RETRACT
4. Mixture – IDLE CUT-OFF
5. Ignition Switch – OFF
6. Master Switch – OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Airspeed – 70 Nm/hr
2. Mixture – IDLE CUT-OFF
3. Fuel Selector Valve – OFF
4. Ignition Switch – OFF
5. Wing Flaps – AS REQUIRED
6. Master Switch – OFF

ENGINE FAILURE DURING FLIGHT

1. Airspeed – 78 Nm/hr
2. Boost Pump – ON
3. Fuel Selector – SWITCH TANKS
4. Mixture – RICH
5. Ignition Switch – BOTH, LEFT, RIGHT
6. Transponder – 7700

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EMERGENCY PROCEDURES

FIRE

DURING START ON GROUND

1. Cranking – CONTINUE, to get a start which would suck the flames and accumulated fuel through the carb and into the engine.

If engine starts:

2. Power – 1700 RPM for a few minutes
3. Engine – SHUTDOWN and inspect for damage

If engine fails to start:

4. Throttle – FULL OPEN
5. Mixture – IDLE CUT-OFF
6. Cranking – CONTINUE
7. Fire Extinguisher – OBTAIN
8. Engine – SECURE

ENGINE FIRE IN FLIGHT

1. Mixture – IDLE CUT-OFF
2. Fuel Selector Valve – OFF
3. Master Switch – OFF
4. Cabin Heat and Air – OFF

ELECTRICAL FIRE IN FLIGHT

1. Master Switch – OFF
2. Avionics – OFF
3. All Other Switches (except ignition) – OFF
4. Vents/ Cabin Air/ Heat – CLOSED
5. Fire Extinguisher – ACTIVATE (if available)

CABIN FIRE

1. Master Switch – OFF
2. Vents/ Cabin Heat – CLOSED
3. Fire Extinguisher – ACTIVATE (if available)

WING FIRE

1. Nav & Strobe Lights – OFF
2. Landing Light – OFF

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FAR 91.125 - ATC light signals.

ATC light signals have the meaning shown in the following table:

Color and type of signal	Meaning with respect to aircraft on the surface	Meaning with respect to aircraft in flight
Steady green	Cleared for takeoff	Cleared to land
Flashing green	Cleared to taxi	Return for landing
Steady red	Stop	Give way to other aircraft and continue circling.
Flashing red	Taxi clear of runway in use	Airport unsafe—do not use
Flashing white	Return to starting point on airport	N/A
Alternating red and green	Exercise extreme caution	Exercise extreme caution

Compass Headings, VFR under 18,000ft

Course	Altitude
0 – 179 degrees	Odd thousand +500
180 – 360 degrees	Even thousand + 500