Van's Aircraft RV-7A

Pilot's Operating Handbook

N585RV

PERFORMANCE – SPECIFICATIONS

SPAN: ……..25’ 0”
LENGTH……..…….20’ 4”
HEIGHT: ……..……7’ 10”
SPEED:
Maximum at Sea Level ….……..180 knots
Cruise, 75% Power at 8,000 Ft ….……..170 knots

RANGE (includes 3 gal. for taxi, takeoff & climb):
75% @ 8000’ , no reserve…….….700 sm
55% @ 8000’ no reserve ……..…880 sm
75% @ 8000’, one hour (10 gal) reserve ……..…...500 sm
55% @ 8000’, one hour (10 gal) reserve ……...680 sm

RATE OF CLIMB AT SEA LEVEL ….…….1,600 FPM

SERVICE CEILING ……19,500 Ft

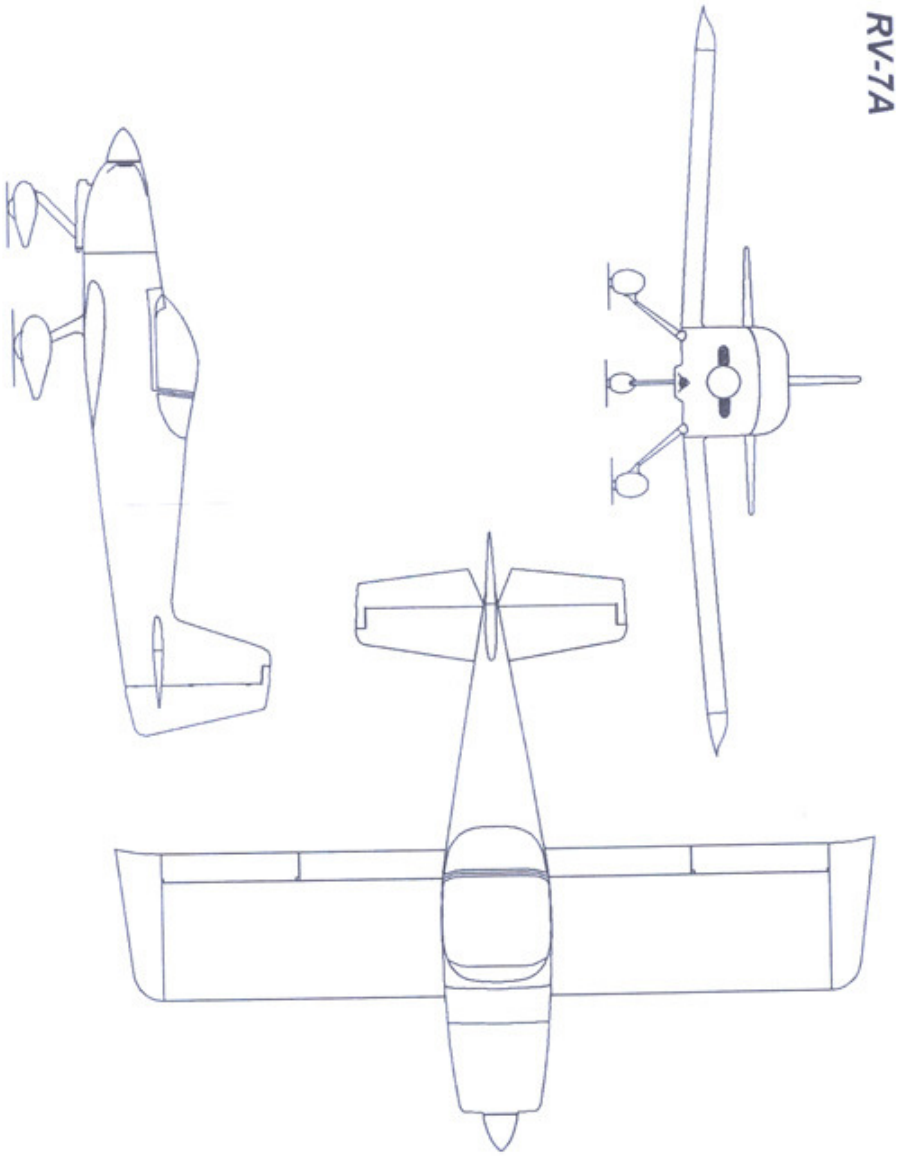
TAKEOFF PERFORMANCE: ……..……575 Ft
LANDING PERFORMANCE: ……..…….……..500 Ft
STALL SPEED (CAS):
Flaps Up, Power Off ……..…….54 knots
Flaps Down, Power Off ……..……50 knots
MAXIMUM WEIGHT (Normal Category):..……..…..1800 Lbs.
EMPTY WEIGHT ……..…….…….1086 Lbs.
MAXIMUM USEFUL LOAD:…….……..…..714 Lbs
BAGGAGE ALLOWANCE ……..…….…….……100 Lbs.
WING LOADING (Pounds/ Sq. Ft) ……..…..……14.8 Lbs.
POWER LOADING (Pounds/ HP) ……10 Lbs.
FUEL:
Capacity ……..……159 L – (42 US Gal) Total
Type ……..…….100 LL
OIL CAPACITY ……..……8 Qts
ENGINE: Superior…. ……XP-1O-360-1AA2
PROPELLER: Hartzell…….……..…HC-C2YR-1BF

AIRSPEED LIMITATIONS

	SPEED	IAS	REMARKS
VNE	Never Exceed Speed	**200 knots**	Do not exceed this speed in any operations.
VNO	Maximum Structural Cruising Speed	**168 knots**	Exceed this speed only in smooth air.
VA	Maneuvering Speed	**123 knots**	Do not make full control movements above this speed. Full elevator deflection will result in a 6g load at this speed.
VFE	Maximum Flap Extended Speed	**95kt -** 20° **87kt-** Full	Do not exceed this speed with flaps down
Vy	Best Rate of Climb	**95 knots**	
Vx	Best Angle of Climb	**70 knots**	
Vs	Stall Speed Clean	**55 knots**	
Vso	Stall Speed Landing Configuration	**50knots**	

AIRSPEED INDICATOR MARKINGS

MARKING	IAS VALUE OR RANGE	SIGNIFICANCE
White Arc	**50-87 knots**	Full Flap Operating Range. Lower limit is Vso. Upper limit is maximum speed with flaps extended
Green Arc	**55-168 knots**	Normal Operating Range. Lower limit is Vs. Upper limit is maximum structural cruising speed
Yellow Arc	**168-200 knots**	Operations must be conducted with caution and only in smooth air.
Red Line	**200 knots**	Maximum speed for all operations


RV-7A

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) Engine gages – ON
h) Fuel Quantity -- CHECK QUANTITY
i) Flaps – DOWN
j) Master Switch -- OFF

2. EMPENNAGE

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

3. LEFT 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) Pitot Tube Cover -- REMOVE and check for blockage
g) Main Wheel Tire -- CHECK for proper inflation
h) Chock -- REMOVE
i) Right Wing Tank – SUMP
j) Fuel Quantity -- CHECK VISUALLY
k) Fuel Filler Cap – SECURE

4. NOSE

a) Oil Level -- CHECK, don't operate with less than 5 quarts
b) Propeller and Spinner -- CHECK for nicks and security, grease & oil leaks. (Gentle shake each blade to feel for movement up to 1/8th inch allowed)
c) Cowl Hinge Pins – CHECK for security
d) Air Inlet -- CHECK for restrictions
e) Nose Wheel Tire -- CHECK for proper inflation
f) Chock-remove
g) Fuel Tank Vents-CHECK for blockage

5. RIGHT 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) Left Landing Light -- CHECK condition
h) Nav and Strobe--CHECK Condition
i) Aileron -- CHECK freedom of movement and security
j) 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) Master Switch-Alternator – ON
b) Flaps -- UP
c) Set Prop control full in
d) Fuel Boost Pump -- ON
e) Open throttle wide, move mixture control to "Full Rich" until a slight but steady fuel flow is noted (approx.3 to 5 seconds) then return throttle to "Closed" and return mixture control to "Full Rich"
f) Fuel Boost Pump – OFF
g) Open Throttle ¼ of travel
h) Turn key (mags) to "Both"
i) Propeller Area -- CLEAR
j) Turn key-start position
k) Move Mixture control slowly and smoothly to lean slightly
l) Oil Pressure -- CHECK 25 psi at idle
m) Avionics & Instruments – ON

STARTING ENGINE (Hot)

a) Flaps -- UP
b) Mixture "idle cut-off"
c) Throttle at least 1/4 open
d) Prop -- HIGH RPM
e) Boost pump on for 30 seconds
f) Boost pump off
g) Master Switch-Alternator – ON
h) Propeller Area -- CLEAR
i) Ignition Switch – START
j) When it catches quickly push the mixture in (to the run position) and retard the throttle to idle.
k) Avionics & Instruments -- ON
l) Oil Pressure -- CHECK 25 psi at idle
m) Nav & Strobe – ON

BEFORE TAKEOFF

a) Brakes -- SET
b) Canopy -------- Main Latch – SECURE
c) Flight Controls -- FREE and CORRECT
d) Flight Instruments – SET DG to Compass
   - Altimeter – CORRECT PRESSURE
   - GPS—CURRENT DATA AND PROGRAMMED
e) Fuel Selector Valve -- DESIRED TANK
f) Mixture -- RICH (below 3000')
g) Elevator and Aileron Trim -- NEUTRAL
h) Throttle -- 1800 RPM
   - Magnetos -- CHECK (Right 125 max drop, 50 diff max)
   - Prop – cycle (2x) CHECK operation (do not allow the RPM to drop more than 500 RPM)
   - Engine Instruments -- CHECK
   - Throttle -- IDLE
i) Radios -- SET
j) Fuel Boost Pump -- ON
k) Transponder – ALTITUDE
l) Flaps to 20 degrees
m) Passenger – READY and willing

TAKEOFF

NORMAL TAKEOFF

a) Wing Flaps – UP
b) Prop – HIGH RPM
c) Align on center line
d) Throttle -- Gently & Smoothly to FULL OPEN
e) Elevator Control – LIFT NOSE WHEEL (55kts)
f) Climb Speed -- 95 knots
g) Trim

SHORT FIELD TAKEOFF

a) Wing Flaps – 20 degrees
b) Prop – HIGH RPM
c) Brakes – APPLY
d) Throttle -- Gently & Smoothly to FULL OPEN
e) Mixture – RICH (above 3000' lean to obtain max RPM)
f) Brakes – RELEASE
g) Climb Speed – 78 knots (Vy)

ENROUTE CLIMB

a) Airspeed – 108-130 knots
b) Throttle – 25 in Hg, or full throttle
c) Prop – 2300-2400 RPM
d) Boost Pump – OFF at 1000 feet AGL
e) Fuel Pressure – CHECK
f) Trim
g) Mixture – LEAN above 5000'

CRUISE

a) Throttle – 23.6 in Hg
b) Prop – 2360 RPM
c) Trim – ADJUST
d) Mixture – LEAN to 100 deg F rich of peak
e) Avoid continuous operation of Prop between 2050 to 2300 RPM and 2600 to 2700 RPM

LANDING

a) Approach speed 80 knots
b) Flaps – 15 degrees
c) Prop control full rpm
d) Engine 1800-1900 rpm
e) Fuel – Fullest Tank
f) Base Leg - Flaps 25 degrees – 75kts
g) 70 knots final-Full Flaps

AFTER LANDING

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

ENGINE SHUTDOWN

a) Flaps – DOWN
b) Prop – FULL FORWARD
c) Throttle – IDLE
d) CHT decidedly dropped
e) All electrical switches – OFF
f) Avionics and Instruments.-- OFF
g) Mixture – IDLE CUT-OFF
h) Wait for shut down
i) 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

Performance

Cruise Performance at 8,000'(TAS)

KNOTS	RPM	MAP	Fuel Flow	% Power
171	2450	23"	10.5 GPH	75%
162	2350	22"	9.5 GPH	65%
154	2250*	21"	8.5 GPH	55%

* avoid continuous use at this prop setting

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	500 sm
65% Power	590 sm
55% Power	680 sm

No Reserve:

75% Power	700 sm
65% Power	790 sm
55% Power	880 sm

AEROBATIC INFORMATION

Weight Limitation – 1600 Pounds

Recommended Entry Speeds:

Loops, Horizontal Eight's	120-165 knots
Immelman Turns	130-165 knots
Aileron Rolls, Barrel Rolls	105-165 knots
Snap Rolls	70 - 95 knots
Vertical Rolls	156-165 knots
Split-S	87 - 95 knots

WEIGHT AND BALANCE DATA

Manufacturer: John C. Droege Model: RV-7A
Serial: 72127 Registration: N585RV

Maximum Weights:
Aerobatic 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 Leading.Edge. = 70 inches aft of datum
Main wheel right = 93.96" aft of datum
Main wheel left = 93.96" aft of datum
Nose wheel = 39.11" 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)

N585RV weighed at Flying W Aviation in
Ontario, OR October 26, 2007 (Revised 12/15/2010)

Component	Weight*	Arm =	Moment
Left main	390	93.96	36644
Right main	388	93.96	36456
Nose	302	39.11	11811
sub total	**1080**		**84912**
Empty C.G	**78.62**		

Engine Information

Model: …….. Superior XP-IO-360-1AA2
HP: …… 180
Fuel: …….. 91/96 or 100/130 octane minimum
…….. 100LL
Oil Filter: ….. Champion CH48110

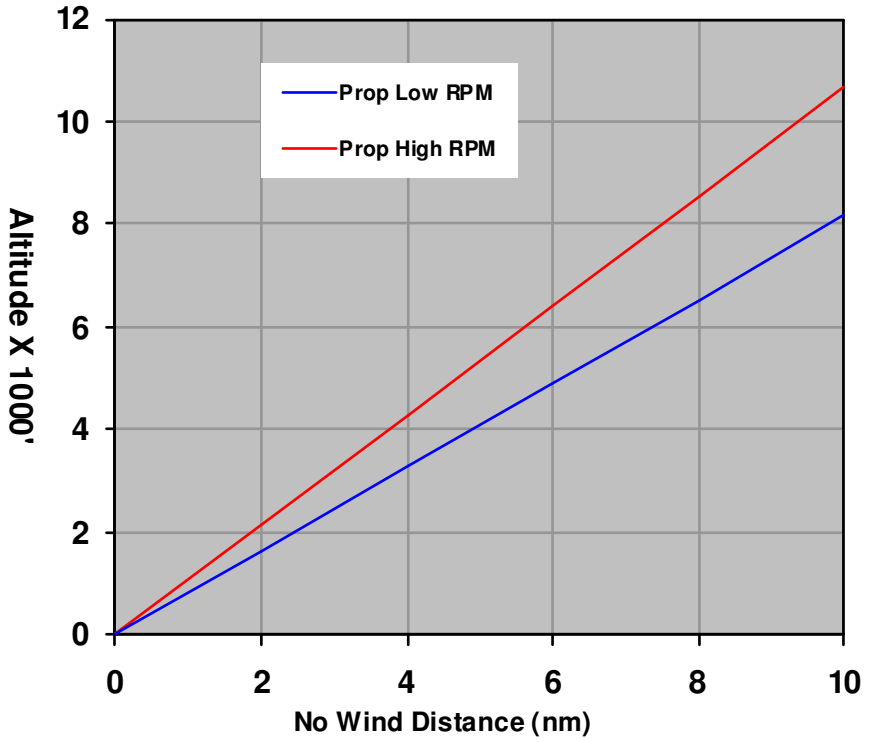
OIL: Avg Ambiant Air	MIL-L-6082 Grades	Ashless Dispersant Grades
Above 80F	SAE 60	SAE 60,20w50
Above 60F	SAE 60	SAE 60
30 – 90F	SAE 40	SAE 40,50
0-70F	SAE 30	SAE 30,40 or SAE 40
Below 10F	SAE 20	SAE 30 or 20w30

Oil Sump Capacity …….. 8 U.S. Quarts
Minimum Safe Quantity ...4 U.S. Quarts

Operating Conditions:

Oil Inlet Temp: 180 deg F desired, 245 deg F Maximum
Oil Pressure: 115 psi max; 45 psi min; 25 psi idle
Fuel Pressure: 35 psi max; 2 psi min; 28.5 psi desired
Cyl. Head Temp 150 deg F – 400 deg F desired range, 500 deg F max
Max oil consumption .89qts/hr. at cruise

Engine Out Glide Performance
Airspeed 75 Kts



EMERGENCY PROCEDURES

AIRSPEEDS FOR EMERGENCY OPERATIONS

Engine Failure After Takeoff:
Wing Flaps Up ……. 78 knots
Wing Flaps Down …….. 70 knots

Maneuvering Speed (Va) ……. 123 knots

Maximum Glide …… 78 knots

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.

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 knots
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 knots
2. Boost Pump – ON
3. Fuel Selector – SWITCH TANKS
4. Mixture – RICH
5. Ignition Switch – BOTH, LEFT, RIGHT
6. Transponder – 7700

EMERGENCY PROCEDURES

FIRES

DURING START ON GROUND

1. Cranking – CONTINUE, to get a start which would suck the flames and accumulated fuel 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)

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
